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ADDRESSES AND ORIGINAL ARTICLES

THE FIBROSES OF THE HEART.*

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"But it is a great thing, let me tell you, to understand the imperfections of our knowledge, and so to analyse its defects as to be made aware what parts of a subject still remain (as it were) in the shade, and need to be brought into clearer view by the light which future observation may bestow upon them."

So wrote Latham of the diseases of the muscle of the heart in 1845. To-day some of his problems have been solved, some are still undecided, and some still remain in the dark of midnight.

Causes of Fibrosis.

It is a long time since Morgagni recorded the first case of fibroid heart, and it was 100 years later before its causes were appreciated. The old nomenclature "chronic interstitial myocarditis" reflected the earlier views of its causation, and it was only in the eighties of last century that Weigert (1880), Charlewood Turner (1881), and Martin (1881) directed attention to its association with disease of the coronary arteries. The influence of syphilis had already been made known by Ricord (1845) and Virchow (1859). These three causes—myocarditis, ischæmic necrosis, and syphilis—are the chief causes of fibrosis. The other causes—tumour, tubercle, hydatid disease, wounds, and trauma—are of rare occurrence.

In fibrosis of the heart the new formed connective tissue is never uniformly distributed throughout the heart, but is scattered in little islets or bands throughout the muscle. Sometimes only a single patch is present, but most frequently the foci are multiple, and they may be numerous. Their shape varies. They may be rounded, oval, or star-shaped, or a long ribbon of varying thickness. The margins of the patches are always ill-defined and merge gradually into more or less normal muscle. The patches are of all sizes, sometimes mere pinpoints, sometimes blocks even an inch in diameter.

Fibroid patches are most common in the left ventricle though they may be found anywhere. The musculi papillares are most frequently affected, the papillæ becoming shrunken and deformed. The lower third of the left ventricle, the adjacent parts of the septum, and the posterior wall of the left ventricle about the junction of its upper and middle thirds are the next most common sites. On the right side the musculi papillares and the lower part of the ventricle are most frequently involved. The patches may, or may not, extend to the endocardium and pericardium. As a rule they are situated deeply, and do not reach the surface, but if the lesion is gross the overlying endocardium is always thickened, and less frequently the visceral pericardium. In lesser lesions one or other may be involved. If a large area of the wall is affected it is usually thinned, and may measure only a fourth of the normal thickness. But the whole of the muscle cells never completely disappear, a few cells along the endocardial and the pericardial surfaces persisting, being kept alive by the endocardial blood or the superficial circulation.

* The St. Cyres Lecture delivered at the National Hospital for Diseases of the Heart on June 4th, 1930.

ACUTE MYOCARDITIS.

The acute lesions found in the myocardium are varied. In acute infective endocarditis, and pyæmic conditions generally, infective embolism may occur, but the lesions are generally minute because patients with infective myocardial lesions die early. The foci may be due to a direct spread from an infected valve or patch of mural endocarditis, or to dissemination of infected blood through the coronary arteries.

Non-suppurative foci are of common occurrence, especially in cases of rheumatic endocarditis. The nodules are small and invisible to the naked eye. They are most common in the ventricles, especially the left, and are often situated in the vicinity of, or around, an arteriole. The essential lesion is a round-celled infiltration of the tissues. These cells may be few in number, and the adjacent muscle apparently normal; but if they are numerous they infiltrate between the muscle cells which in such case are degenerate. Occasionally they surround a tiny area of necrotic muscle. In most cases the foci are discrete and perhaps widely separated from each other, but the infiltration may be diffuse and larger areas involved. Muir suggests that in some cases the lesion is a focal necrosis of muscle cells, followed by a connective tissue reaction, while in others inflammatory foci around the blood-vessels destroy the adjacent muscle cells. In any case the ultimate results are the same.

In some instances the vessels are similarly affected, an arteritis or phlebitis occurring, often accompanied by thrombosis. The lymphatic channels, too, may be blocked by masses of cells. In later stages islets of connective tissue can be seen surrounding the arteries, and spreading for a variable distance between the adjacent muscle cells.

These myocardial lesions are not confined to cases of rheumatic disease, or indeed to cases of endocarditis. They have been found in many acute infections—pneumonia, pleurisy, diphtheria, sepsis, small-pox, enteric fever, scarlatina, blackwater fever—but they are much more common in the former diseases.

THE ISCHÆMIC FIBROSES.

A large group of cases of fibrosis are caused by interference with the blood-supply through the coronary arteries, which, as is well known, are frequently affected by pathological processes, and almost always show some change after middle life. The orifices may be affected in disease of the aorta, and plaques of atheroma, endarteritis obliterans, and diffuse thickenings are common in the larger and the smaller trunks. In many instances the lumen of the affected vessels is narrowed or blocked, and the corresponding muscle cells are more or less starved. But this is not invariable.

The coronary circulation is peculiar to itself. The two main arteries anastomose with each other at their extremities, and a similar anastomosis obtains between their main descending branches. The terminal vessels also communicate freely with each other, and the capillary network around the muscle cells is large and ample. But although this is so interference with the blood-supply through one vessel is seldom sufficiently compensated by anastomotic developments, and some damage to the muscle as a rule results. I have, however, seen at least five cases in which blocking of one of the main arteries was well compensated by enlargement of the other, and only

a few small patches of fibrosis were found on microscopic examination. Campbell has shown in radiograms of injected hearts the great amount of anastomotic development which may occur in these cases and thus obviate, in large measure, the results of occlusion of an artery. He points out, too, that the distribution of the coronary arteries is very variable, and that the blood-supply of any part may be derived from different arteries in different cases, so that the results of occlusion of a given artery are not constant. The neuromuscular tissues in particular are so lavishly supplied with alternative anastomotic possibilities as to explain the infrequency of blocks in ischæmic disease. But an adequate anastomosis is exceptional; fibrosis, of greater or lesser degree, is the common result of occlusion.

Even in the limbs the possibilities of anastomotic developments are considerable. One of our patients who was suffering from subacute bacterial endocarditis had a rigor on the evening of Nov. 6th, and complained of pain in the chest and the left forearm. Next morning the left arm was rather cold and slightly blue, the colour taking eight seconds to return after pressure upon it as against three seconds in the other hand. The radial pulse was imperceptible and the left subclavian artery was tender and blocked, just beneath the outer end of the clavicle. Two days later the hand was quite warm and the return of blood after pressure more rapid. The artery remained completely closed, but there were no signs of gangrene before his death on Nov. 23rd.

The possibility of effective anastomotic developments depends largely upon the rate of closure of the vessel. If the closure is sudden necrosis results, the area involved varying in size according to the artery concerned. If the closure is gradual some anastomotic developments can take place. In the first case infarct results. In the second some muscle cells undergo ischæmic atrophy while the "less noble" connective tissue survives. In the first case the scar is isolated and massive; in the latter small, paraarterial in site, and perhaps multiple. In infarct, too, hæmorrhage may take place into the softened tissues, and rupture ensue; or, if the wall survives but is weakened, aneurysmal dilatation may occur.

SYPHILITIC LESIONS.

The typical syphilitic lesion is the gumma, but it is rare. Gummata vary in size from microscopic lesions to tumours as large as a pigeon's egg. They may be single or multiple, and may occur anywhere. A diffuse fibrosis, subacute interstitial fibrosis, has been found in the secondary stages of syphilis in the adult, and more frequently in infants and young children in congenital syphilitic disease.

But the most important and the most frequent sequel of syphilis is due to syphilitic disease of the coronary arteries and ischæmic fibrosis. The arteries may be narrowed or occluded at their orifice by a syphilitic plaque in the aorta, or in their course by a specific endarteritis obliterans. Infarct or paraarterial fibrosis results. The ultimate muscular lesions are not specific, though they own a specific cause.

Recognition of Myocarditis.

The symptoms in myocardial disease follow fairly closely their pathological origin. They vary, of course, in different cases, for in some instances the cardiac lesions are merely part of a general arterial disease which has hit first or most severely another branch of the arterial tree; while in others they are the essential feature. They vary in their mode of onset. If a vessel is suddenly occluded the onset of symptoms is abrupt, while it is insidious if the lumen is slowly narrowed. In some cases a progressive narrowing is succeeded by a sudden thrombotic closure, and an acute exacerbation follows on a chronic train of symptoms. Thrombosis, too, may occur within the cardiac cavities, and embolism, anywhere, may suddenly alter the clinical picture. Often pericarditis ensues, and, though usually a subsidiary affair, may even dominate the scene. Sometimes, too, the primitive tissues of the heart are hit, the intrinsic mechanism of the heart is deranged, and a change of rhythm (e.g., heart-block) imparts its special feature to the clinical syndrome.

The dramatic attacks of ischæmic disease of the myocardium contrast strongly with the complaints of acute myocarditis. In the former, pain is often a striking symptom, the onset is sudden, and the most serious symptoms immediately precede death. In the latter, pain is exceptional unless pericarditis supervenes; the onset is generally insidious; and serious symptoms may occur early in the illness. In acute myocarditis, too, its symptoms are masked in great measure by the symptoms of the primary illness, and can only be differentiated with difficulty.

Acute myocarditis is most common in cases of acute endocarditis, whether of rheumatic or other origin, and in diphtheria, though it may obtain in almost any infection. In the infections as a whole the granular, fatty, and hyaline degenerations which are constantly present in the heart, are largely responsible for the cardiac asthenia, and although one might infer a priori, from our pathological knowledge, that myocarditis is present in every case of acute endocarditis actual evidence of its occurrence during life is only afforded by the appearance of some disturbance of the cardiac rhythm, sign of interference with the intrinsic mechanism of the heart. We know, too, that arrhythmia is often due to functional or nervous derangements, and that the heart-blocks alone are definite evidence of myocarditis. In a few cases the occurrence of a nodal rhythm, or progressive cardiac failure without obvious cause, afford presumptive evidence of its presence.

The first cases of heart-block in acute disease were recorded by Jellinek and Cooper (gonococcic endocarditis), James (malignant endocarditis), and Gerhardt (enteric fever with arthritis) in 1908; and two years later Magnus Alsleben reported its occurrence in diphtheria, a disease in which it has been frequently observed.

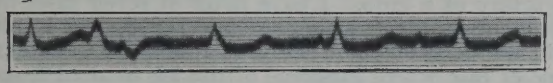
The occurrence of heart-block in myocarditis is occasionally accompanied by the Adams-Stokes syndrome; in a case of this kind in Sinai during the war, in a patient who was suffering from diphtheria, the attacks were numerous. But this is unusual; cardiac symptoms alone are the rule.

A man, aged 40, was taken ill seven weeks before admission into hospital with a typical attack of rheumatic fever. He remained in bed for a fortnight and at once resumed work, but after a few days had a recurrence of his arthritis and was again confined to bed for a fortnight. He again resumed his work, but three days later, while dressing, he was seized with acute pain beneath the sternum accompanied by breathlessness and palpitation, and collapsed. When admitted into hospital a fortnight later he was very breathless and pale with a small irregular pulse which numbered about 66 per minute. The heart was dilated, the liver large and tender, and the bases of the lungs congested. He died next morning. An electrocardiogram showed full heart-block, the auricles running about 78 and the ventricles at 59, their regular rhythm being interrupted at intervals by right ventricular extrasystoles (Fig. 1). The post-mortem examination showed the explanation of the block. The mitral cusp of the aortic valve was involved in an acute inflammation which had spread deeply, affecting the adjacent parts of the anterior mitral cusp, producing a small aneurysmal pouch, as well as the adjacent parts of the interventricular septum. Spreading through the septum it had infected the septal cusp of the tricuspid valve. As the lesion involved the septum immediately behind the undefended space the bundle of Kent must have been directly affected.

A partial block is more common.

A man, aged 21, was admitted into hospital suffering from rheumatic fever of two days' duration. His pulse was quite regular and of fair value, but during the night it became irregular and less frequent, 84 against 110 on admission. Electrocardiograms showed a partial heart-block, every third auricular beat failing to evoke a ventricular contraction. Next day the pulse numbered 70 and was still irregular but the missed beats were less frequent. On the day after the pulse was regular and numbered 80, each auricular beat being followed by a ventricular contraction, and the P–R interval measured 0·22 sec. Two days later the pulse was occasionally irregular, the P–R interval measuring about

FIG. 1.



Full heart-block with one extrasystole.

0·24 sec., and some ventricular contractions failing. The pulse subsequently was always regular, and the P–R interval soon returned to normal limits.

Still more frequently a latent block is shown on examination, the pulse remaining quite regular.

One of our patients who died at the age of 26 from acute endocarditis showed during life a regular pulse which invariably exhibited a prolonged a-c interval of about 0·25 sec. Post-mortem examination showed an early interstitial myocarditis, the muscle cells in some of the patches being degenerate. The a-v node was congested but otherwise normal. The bundle was involved in three places in inflammatory foci similar to those found elsewhere.

Block of these varying degrees is not uncommon in acute rheumatism. In our series of 428 cases of acute rheumatism block was *recorded* in 13.

The diagnosis of bundle branch block is only possible by electrocardiography, for, unlike heart-block, it gives no sign of its occurrence by alterations in the rate and regularity of the pulse. Its incidence is, in consequence, not yet fully recognised. It is most commonly found in patients who are suffering from chronic myocarditis, the result of ischæmic fibrosis. The left branch with its ribbon-like form and its ample blood-supply, derived from both coronary arteries, is but seldom affected, while the right branch, a slender strand, supplied by the anterior septal branches of the left coronary artery, and occasionally by the ramus cristæ supraventricularis, a branch of the right coronary artery, is more often found to be defective. Mural endocarditis is rarely present on the right side of the heart, and bundle branch block is rarely due to myocarditis. In the only case in which myocarditis seemed the probable cause, the patient was a man, aged 51, who had had an attack of acute rheumatism a few months before accompanied by aortic valvular disease. The block persisted until his death six years afterwards.

In three cases a temporary block has been recorded, which suggests that the cause may have been a myocarditis. In Lewis's case the block was present during a febrile attack; in Ritchie's case when the patient was jaundiced; and in Hewlett's case when the patient was suffering from urinary sepsis. We must remember that blocks may be produced by such drugs as digitalis, aconitine, and muscarine, and so presumably by toxic causes, without definite structural disease; but their influence is generally transient. In the absence of such intoxications, and the presence of an acute endocarditis, the existence of acute myocarditis may be fairly assumed.

NODAL RHYTHM.

Nodal rhythm may be produced in experiment in two ways—by throwing the sino-auricular node out of action, thus permitting the auriculoventricular node to become dominant and to regulate the action of the heart; and by enhancing the activity of the auriculoventricular node, so that superseding the sino-auricular node it sets the pace of the heart. In the first case the rate of the heart is slowed; in the second the rate is increased.

Clinically three groups of nodal rhythm may be distinguished. In one paroxysms of nodal tachycardia occur from time to time; in another the cardiac rate is infrequent or but slightly increased; in the third the pulse-rate is persistently rapid. The first group are manifestly due to functional causes; the second occur under diverse conditions, sometimes in patients who are not labouring from any cardiac disorder; the third are sometimes associated with myocarditis. In one case a continuous nodal rhythm was present for a month before death, the pulse-rate ranging between 110 and 140, with a regular rhythm.

The patient was a woman aged 27 who had suffered from acute rheumatism in 1900 and 1910. The second attack was severe and prolonged, but she made a satisfactory recovery. A year later she gave birth to a healthy baby, and four months later a third attack of rheumatism ensued. She returned at once to hospital, seriously ill with arthritis and pneumonia. Her progress was unsatisfactory, the fever persisting and congestive failure appearing. She died two months later from cardiac failure. Post-mortem examination showed an adherent pericardium and chronic endocarditis of the aortic and mitral valves, an acute endocarditis being present on both these valves and also on the tricuspid valve. An extensive fibrosis was present in the muscle, spreading from the mitral valve into the auriculo-ventricular node, in which there were many fibroblasts and round cells. The lesions found were evidently of different ages, the older ones perhaps dating from the illness of 1910, though no direct evidence of myocardial mischief was elicited at that time. The more recent lesions, too, were evidently of some standing, as the fibroblasts in the cellular infiltrations were numerous, a fact which may be correlated with the appearance of the nodal rhythm a month before death. The earlier tracings were of sinus character.

In the records of six cases of this kind, in which microscopic examination of the muscle showed inflammatory lesions in the auriculoventricular node, three of these patients were suffering from acute rheumatism and three from infective endocarditis.

Progressive cardiac failure, *without obvious cause*, is always suggestive of myocardial lesions, which in some cases may be assumed to be inflammatory in nature.

A man, aged 22, died in our wards in May, 1920. He had had rheumatic fever in 1911 and 1914, and had made a good recovery, though left with a mitral leak. He worked regularly throughout the war, but in the spring of 1919 he undertook rather arduous work and cardiac symptoms soon supervened. He re-entered the ward in May, 1919. At this time he had some bronchitis, and his auricles were fibrillating, but steadily improved on the subsidence of the catarrh and the administration of adequate doses of digitalis. In December he was walking four miles daily for recreation. In January, 1920, he caught cold and all his symptoms returned. As the pulmonary lesions improved his discomforts lessened, and he was able to walk about the ward. But the improvement was evanescent, and in April it was clear that his heart was failing. He died in the middle of May.

There was no obvious immediate cause for the fatal termination. His symptoms in the spring of 1919 had been associated with excessive physical exertion, and in the beginning of 1920 with bronchitis. But none of these were active in March, April, May, though the cardiac failure was progressive, and his heart steadily dilating. His age and the state of his arteries negatived ischæmic fibrosis, and the probable cause of the progressive failure seemed to be myocarditis, the sequel of a subacute endocarditis. Post-

mortem examination showed the correctness of the assumption, a gross chronic lesion of the mitral valve being found with slight acute lesions of the mitral, aortic, and tricuspid valves, and widespread acute and subacute myocardial inflammation.

Clinical Features of Ischæmic Fibrosis.

The symptoms of ischæmic fibrosis differ from those of myocarditis. The dominating symptom is cardiac pain, though pain is not invariably present; the onset of the symptoms is usually sudden; and death *may* occur suddenly at any time without warning.

ANGINA PECTORIS.

The current theory of angina pectoris is a revival of an old idea which was first formulated by Allan Burns in 1908, and has been elaborated from the experimental side by J. A. MacWilliam (with W. J. Webster), in 1923, and from the clinical side by C. S. Keefer and W. H. Resnikinin 1928. According to this theory angina is the result of anoxæmia of the heart—a physiological conception, not an anatomical finding.

Allan Burns's statement may be quoted :—

"In health when we excite the muscular system to more energetic action than usual, we increase the circulation in every part, so that to support this increased action the heart and every other part has its power augmented. If, however, we call into vigorous action a limb round which we have, with a moderate amount of tightness, applied a ligature, we find that then the member can only support its action for a very short time, for now its supply of energy and its expenditure do not balance each other; consequently, it soon from a deficiency of nervous influence and arterial blood fails and sinks into a state of quiescence. A heart, the coronary arteries of which are cartilaginous or ossified, is in nearly a similar condition. It can, like the limb begirt with a moderately tight ligature, discharge its functions so long as its action is moderate and equal. Increase, however, the action of the whole body, and along with the rest that of the heart, and you will soon see exemplified the truth of what has been said; with this difference that as there is no interruption to the action of the cardiac nerves the heart will be able to hold out a little longer than the limb."

MacWilliam approached the question from the experimental side. He applied a tourniquet to the arm and noted the results: (*a*) so long as the forearm muscles remained inactive; and (*b*) when these muscles were thrown into action. As he found that the symptoms might, in part, be due to turgescence of the limb if the constriction was applied suddenly, he made the limb ischæmic by means of an elastic bandage, applied first to the fingers and the hand, and only removed after the tourniquet had been applied.

In a limb thus treated and kept *immobile* no notable result followed for the next 20 minutes, save for some coldness in the parts, an inclination to shift the position of the arm, and a certain amount of discomfort at the site of the constriction. Muscular activity of the forearm muscles, however, rapidly produced notable discomforts. Fatigue, as measured by the number of contractions executed within a given period, and their force, was readily produced, the fatigue point being reached in half or one-third of the time required in the normal limb. The forearm, too, rapidly became painful, and as the fatigue point was approached, so acutely painful, that the desire for relief became urgent. Cessation of the exercise, too, did not relieve the pain, which only ceased after relaxation of the constriction and the advent of fresh blood to the ischæmic muscles. Though relief of pain was thus readily afforded, fatigue was still apparent, and only passed off after some interval of time.

"It need hardly be pointed out," said MacWilliam, "that the foregoing observations have a close bearing upon the problems associated with the production of pain in angina pectoris, showing as they do how readily acute pain can be excited in skeletal muscles working with lack of blood-supply, the pain developing while the contractile power, though to some extent weakened, is still sufficient to execute movements of considerable force and energy—that is, long before complete fatigue."

Comparable experiments occur from time to time in clinical work. We are all acquainted with the pain of intermittent claudication, the sudden gripping of the calf muscles and the weakness of the legs, which ensues in patients with narrowing of the arteries of the legs if the demand for more blood to meet the demand for physical exertion cannot be satisfied at once. We know, too well, the pain of senile gangrene; and pain is a constant feature in embolic blocking of an artery of a limb. I have notes of seven cases of this kind in which gangrene supervened, and in all pain was a serious and early symptom. In another type of case where gangrene of the leg resulted from thrombosis of a popliteal artery the pain was severe and clamant. The patient was walking home from work when he was suddenly seized with acute pain in the leg, so acute that he was able only with difficulty to reach his home a hundred yards away. When admitted into hospital a few hours later the pain was still severe.

It may seem difficult to correlate such occurrences with angina pectoris. Angina occurs in such diverse types of case. It is found in patients with and without heart disease, associated with a high and a low blood pressure, after operations and pregnancy, in patients with high and low blood counts. What common factor can obtain among these patients?

Keefer and Resnik analysed a series of 399 cases of angina, including 13 cases of their own, in whom post-mortem examinations had been made. In all but 19 cases the coronary arteries were diseased, and in the exceptions the aortic valves were incompetent. *Viewed from the physiological standpoint* an anoxæmia of the cardiac muscle can readily be assumed to occur under certain circumstances. Disease of a coronary artery will necessarily limit the flow of blood to the parts concerned, and the blood-supply, while sufficient for the muscle if working quietly, may be insufficient if the extra strain of physical exertion or some temporary elevation of the blood pressure is added. In aortic incompetence the diastolic pressure is low, and as the cardiac muscle is supplied with blood during diastole some ischæmia must necessarily obtain, even when the patient is at rest. In many cases, too, the aorta as well is diseased, and the orifices of the coronary arteries are narrowed and the ischæmia consequently exaggerated.

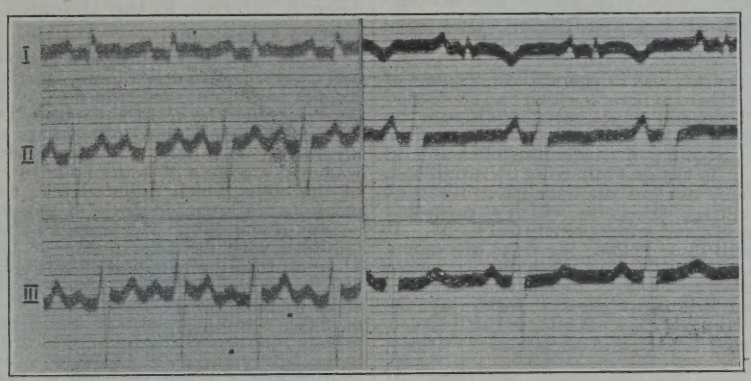
Angina is rare in mitral disease, for congestive failure rapidly ensues on exertion, and the dyspnœa checks exertion before the painful stage of anoxæmia occurs. It is rare in the severe anæmias, as all the tissues of the body are concerned and the general flabbiness prevents the possibility of undue strain upon the heart. But in disease of the coronary arteries *only a part of the heart* may be involved, the greater part of the muscle being unaffected. The heart can thus respond effectively to a demand for increased activity, but the part whose blood-supply is limited now becomes relatively ischæmic and so gives rise to painful sensations. The liability to angina can coexist with the possession of considerable power by the heart as a whole. Intermittent claudication and embolic blocking of the peripheral arteries are exactly comparable to angina and ischæmic necrosis of the heart. If the circulation is impaired symptoms will only ensue if exertion renders the parts relatively anæmic, while if the block is complete the symptoms will continue indefinitely.

Many patients who suffer from angina tell us that while they are capable of undertaking considerable exertion under favourable conditions attacks ensue if they are exposed to cold winds, if exercise is undertaken immediately after food, or if they are subjected to nervous strain. John Hunter's case at once returns to our memory. Prof. MacWilliam says :—

"So far as my observations go there is not necessarily such rise of blood pressure on exposure to cold as would throw a decidedly greater strain upon the heart. It seems to me that some transient attacks of pain, with no obvious and sufficient exciting cause, probably depend on a central nervous factor, an increased susceptibility to pain from irritant impulses arising in the heart. Exposure to cold, for instance, often tends to excite neuralgic pains, anywhere, in a susceptible person."

Such an explanation seems more than plausible. Many of these patients are highly strung and very intolerant of their discomforts. Several patients, too, have informed us that their attacks cease *instantaneously* as soon as they have swallowed a tablet of trinitrin, and before any effects of the drug could have been manifested. Vasomotor alterations in the distribution of the blood may also play a part. "If you eat till you're cold you will live till you're old," the vasomotor reply to the need for an increased blood-supply to the digestive organs after a meal, may perhaps lessen the supply of blood to the systemic arteries elsewhere.

FIG. 2.



20.ii.30. 1.iii.30.
Note the changes in QRST after the attack of 26.ii.30.

VARIETIES OF ANGINAL ATTACK.

It has been my lot to witness a considerable number of attacks of angina. I can see still the anxious expression of a colleague during a seizure, his sweat-bedewed features, his absolute immobility, even his breathing being checked, and his inaudible declinature of a proffered hypodermic injection.

In a second case death occurred. The patient had been ill for some months with attacks of pain which were becoming more frequent and more severe. He drove into town with his doctor, and chatted happily during the drive. On arrival he hurried across the pavement and up the steps of the house, and pain at once supervened. When seen a few minutes later he was sitting restlessly upon a chair, complaining of acute substernal pain which shot down into both arms. He was flushed, excited, and talkative, and tried to make himself more comfortable by changes in position and attempts at retching. After the administration of some amyl nitrite and brandy, the pain abated in severity, but he was conscious that the attack had not ended. In a few minutes an exacerbation occurred, followed by a remission, and again by an exacerbation of the pain. He was coughing from time to time, and expectorating some mucous fluid which was slightly tinged with pink. The attack had now lasted for half an hour, and the pulse failed perceptibly for some moments, but steadied before any stimulant could be applied. His face, at first flushed, became ashen and bluish. The pain again recurred in great severity, the pulse failed, and he died 45 minutes after entering the house.

The pain varied in intensity but never completely remitted. It did not immobilise him and he moved restlessly and talked almost continuously. The pulse at first was a little frequent, full, and quick. During the acme of the pain its rate increased but probably never exceeded 120. It was always regular, the failure in volume and strength being the striking feature.

A third case may be quoted. The patient had had attacks of angina for a year before his admission into hospital, and on the day prior to his admission a severe attack which persisted for 36 hours. Subsequently, his attacks were minimal and of short duration. But on Feb. 26th a severe attack ensued about 9·20 A.M., and continued until the afternoon. When seen a few minutes after the onset he looked very collapsed, and complained of severe pain in the epigastrium extending up into the chest and down the left arm as far as the wrist. His pulse, which had been running in the 80's, was now over 100, and had lost notably in volume and strength. The cardiac sounds were distant and indistinct. In the afternoon the pain passed away and his pulse regained some of its former quality. For the next six weeks his symptoms remained more or less in abeyance until one evening, when some friends were visiting him, an attack supervened. He died almost instantaneously. (Fig. 2.)

In the first of these three cases the pain was intermittent and of short duration. In the second case it persisted and cardiac failure rapidly followed. In the third case, during the attack which was observed, the occurrence of pain was accompanied *at once* by grave cardiac failure, which continued for some weeks. In the first case the anoxæmia was relative and temporary; in the second relative at first, but continued; in the third absolute and continued. In this last case examination revealed a large infarct of the apical part of the heart, due to occlusion of the descending branch of the left coronary artery.

In another group the symptoms are those of congestive cardiac failure. The onset may be sudden or insidious.

A labourer, aged 63, while climbing up a gangway on to a ship suddenly became extremely short of breath and was unable to proceed. His fellow workmen pulled him on to the deck and he soon felt better and was able to go home, where he stayed for four days. As he then felt quite well he resumed his work, but he at once became short of breath and had to take to bed two days later. His feet became swollen, his breathlessness increased, and orthopnœa ensued. He was restless and slept badly. A few days later he began to experience pains in the front of his chest and all his discomforts became intensified. Three weeks after the initial seizure he coughed up a considerable amount of blood, and the hæmoptysis continued. When admitted into hospital a few days later he was collapsed, cyanosed, and cold. His pulse was regular, of moderate pressure, and quick. The heart was normal in size and site and the sounds, though distant and indistinct, were pure. Œdema was extensive, the liver was enlarged and tender, and the bases of the lungs were dull to percussion. He remained in much the same condition for five days, and then died suddenly.

On examination an infarction of the lower two thirds of the left ventricle was found, the wall being thinned and bulging. The left coronary artery was blocked about an inch below its origin. A subacute pericarditis explained the appearance of thoracic pain in the *second* week of his illness.

In the following case the onset of the symptoms was insidious.

The patient, a painter aged 51, was a healthy man who had had an attack of "influenza" at Christmas, for which he was confined to bed for three weeks. When he resumed his work he found that he was short of breath upon exertion, and felt his heart beating. Two months later he caught cold and bronchitis developed. His ankles became swollen and

the dyspnœa and palpitation worse. He was forced to take to bed in the beginning of March. When admitted into hospital on April 18th he was very short of breath and had to sit up in bed. The feet were œdematous, the liver enlarged, and dullness was present at the bases. The heart was enlarged in both directions, the cardiac sounds were short and of poor quality with a systolic murmur at the base. The pulse was regular, with a blood pressure of 150–110 mm. Hg. His progress was unsatisfactory. Some improvement occurred from time to time, but was invariably of short duration. Infarcts occurred in the lungs, and in August his blood pressure began to fall, touching 110–80 mm. in September. Pneumonia ensued in October, and he died in a couple of days.

Examination showed widespread atheroma of the coronary arteries, the descending branch of the left vessel being almost occluded two inches below its origin, while the right vessel was greatly narrowed in more than one place. A gross fibrosis of the apical third of the left ventricle was present, apparently a dystrophic fibrosis and not the result of infarct.

In another group the symptoms are those of disturbance of the cardiac rhythm. Of these the most common is heart-block, which is sometimes accompanied by the Adams-Stokes syndrome. One case may be mentioned.

The patient, a man aged 47, was in hospital on account of pains in his chest and shortness of breath which had succeeded a "cold." He had well-marked aortic valvular disease, the result of rheumatic endocarditis many years before, and he had been in hospital on account of cardiac insufficiency on two previous occasions. On the day following his admission, at 3·40 in the afternoon, he had an epileptiform attack which lasted for five minutes. His pulse, which at noon had numbered 112, was now 32, and subsequently fell to 22. It remained infrequent until four o'clock the next afternoon, when it was found to number 84. His subsequent progress was good. Electrocardiograms taken during the period of infrequent pulse showed full heart-block. Next day the rhythm was of sinus origin, with a P–R interval of 0·32 sec. A week later it measured 0·20 sec., and a week later 0·14 sec.

In yet another group the symptoms are those of disease in organs other than the heart, due to similar arterial causes, no special suggestions of cardiac difficulty being present, and the diagnosis being made on the post-mortem table. Cerebral symptoms are most common, and were due in this series to embolism, thrombosis, and rupture of a cerebral aneurysm. Several of our clinical series have had strokes before or after cardiac seizures. One of our patients died from chronic uræmia, the sequel of cirrhotic kidneys.

The last but by no means the smallest group is of little clinical interest, the cases of "sudden death" whose cause is only ascertained after death. It seems to contain almost every case of gumma of the heart (Herringham) as well as many cases of ischæmic necrosis and rupture of the heart.

The Diagnosis.

The recognition of myocardial fibrosis depends partly upon the story of the illness and partly upon the physical signs. If we are correct in our conception of the causes of angina its occurrence, apart from aortic valvular disease, pregnancy, operations, or severe anæmia, indicates interference with the coronary blood-supply, and hence a potential or an actual fibrosis. Infarct, heart-block, and bundle branch block are, too, indications of fibrosis.

The diagnosis of angina is founded on the story of the patient. The occurrence of pain in the chest on exertion, however slight, is the criterion. The early symptoms are often trivial, their significance is missed, and the diagnosis is made too late for effective treatment to be possible. There is no difference of kind save in degree between angina and infarct, though the clinical syndrome differs. At the present time it is unnecessary to refer in detail to the differential diagnosis, which is well shown in the following table, based upon the tables of Keefer and Resnik and of Bedford and Parkinson.

	ANGINA.	ISCHÆMIC NECROSIS.
Anoxæmia	Relative and transient	Absolute and permanent.
Pain	Of short duration	If present prolonged.
	Occurs on exertion and so diurnal	Occurs without obvious cause and often nocturnal.
Epigastric pain	Rare	Not uncommon.
Amyl nitrite	Often relieves	Has no effect.
Rest	Relieves	Has little or no effect.
Attitude	Immobile	Restless.
Cardiac failure	Rare	Often, indeed usually, present.
Dyspnœa	Rare	Often present.
Pulse—		
Rate and rhythm	Often unchanged	Often altered.
Blood pressure	May be high	Usually falls.
Electrocardiogram	Often abnormal	Usually abnormal.

One symptom which is not uncommon in infarct demands more attention. The pain is not infrequently referred to the abdomen and associated with gastric symptoms.

One of our patients played a game of golf in the afternoon, and then set off to drive home, apparently in his usual health. Engine trouble ensued and he was delayed, and, as he was late for dinner, he drank some beer. On his arrival home late at night he complained of sickness and vomited on several occasions. He went to sleep about midnight, but was wakened a couple of hours later by severe pain in the front of the chest which radiated into the left arm. The pain necessitated repeated doses of morphia, but lessened in the course of the day. The nausea persisted and he was much troubled with flatulence. For 36 hours after the onset of his symptoms no evidence of cardiac disorder was apparent. The heart was normal in size and site, the cardiac sounds were within normal limits, the pulse was regular, beating at 84 per minute, with a blood pressure of 138–84 mm. (about his usual figure). Pericardial friction was then detected by Dr. A. S. Henderson, who found a pulse-rate of 108 and a blood pressure of 114–80 mm. The gastric symptoms persisted for the next week.

Another patient, who for some months had had several attacks of dyspnœa on exertion, was suddenly, while brushing boots, seized with acute pain about the right breast which passed back into the scapular region, accompanied by retching and vomiting. The sickness and pain persisted all day, notwithstanding the administration of morphia. He had a restless night, and next day was still sick while the pain was less acute. Next morning, 48 hours after the onset, Dr. J. L. Anderson detected pericardial friction. The heart previously had seemed to be normal. The pain was now absent save on movement, but the nausea and flatulence persisted.

Another patient who had suffered for some years from symptoms of cardiac distress complained one day of pains in the abdomen which did not, however, confine her to bed. On the fourth day she was unable to rise and returned at once to hospital. Her complaints were purely abdominal. She had a coated tongue and much flatulence. Her cardiac condition seemed unchanged. She rapidly improved, but three days later became restless and heady, and required a sedative at night. Next morning she was very well and sat up and joked with her neighbours, but at 11 o'clock was seen to become cyanosed quite suddenly and died in five minutes from rupture of the heart through an infarct of the left ventricle.

Another patient had a laparotomy performed for similar symptoms, and recovered from his treatment for the time. He died six months later with cardiac symptoms. An infarct was found about the apex of the left ventricle and the septum.

It is useful to remember that the blood pressure in adults is rarely beneath 120 mm. in the absence of some cardiac disorder.

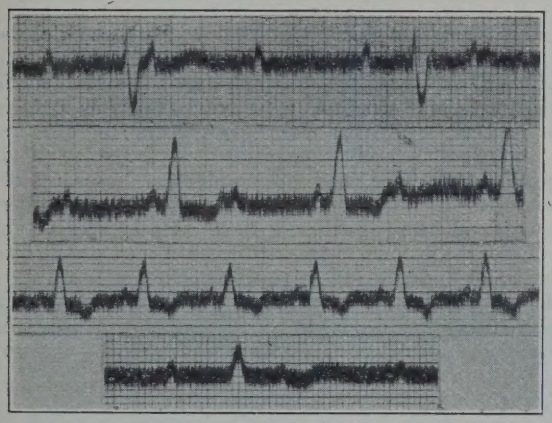
In a certain number of cases definite evidence of myocardial disease is shown by the electrocardiogram, but too much must not be expected from this form of investigation. The electrocardiogram is the record of the changes in potential produced by the orderly mass contraction of the two hearts. If the orderly sequence of events is interrupted by myocardial lesions hitting the bundle branches and interfering with their function abnormal deflexions will occur

in QRS. But lesions elsewhere do not necessarily deform the picture. Deformities will only occur if the mass of tissue thrown out of action is considerable in size and localised. Small focal lesions, whether scanty or numerous, are unlikely to deform the curve, especially if they are more or less uniformly distributed throughout the heart. It must, too, be remembered that a deformed electrocardiogram may return to normal after an infarct, if the process of healing removes the want of balance between the different parts of the heart, or its irritating influence ceases. The records are thus merely the records of damage to the muscle, and in no way an index of the cause of the damage. They may, too, be altered by associated disease of the cardiac valves, or high blood pressure in the systemic or pulmonary circuits.

In cases of angina careful examination of the heart usually reveals some definite abnormality, an increase of the size of the heart, a high or low blood pressure, abnormal cardiac sounds or electrocardiograms. But occasionally the heart seems to be quite normal.

This was the case in a patient aged 63, who had had anginous symptoms for several years. The heart was perhaps a trifle large, but the sounds were pure and of average quality, and an electrocardiogram showed normal

FIG. 3.



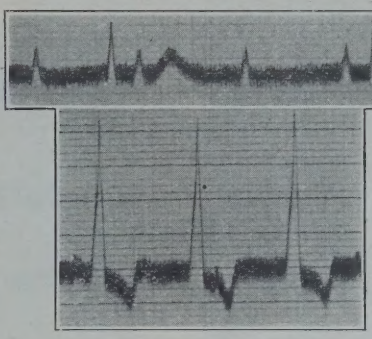
Lead I. The dates of the electrocardiograms, from above downwards, are March 26th, 1926; Sept. 6th, 1927; Feb. 28th, 1929; and Jan. 6th, 1930.

deflexions. His blood pressure was 150–105 mm. A month later he died suddenly after walking home, uphill, against a strong wind. A post-mortem examination of a man, aged 47, who died shortly after admission to hospital, affords an explanation of these cases. He had suffered for a couple of months from anginous attacks. There was a well-marked syphilitic aortitis which had caused a marked stenosis of the orifices of the coronary arteries, the vessels in their course and the myocardium being apparently perfectly healthy. An electrocardiogram would, presumably, have been quite normal.

In the large majority of patients with myocardial lesions, however, some abnormality is apparent on examination. The apex impulse may move outwards. In one of our patients who had an acute endocarditis, with myocarditis, the apex was situated 13·5 cm. from midsternum in May, 14 cm. in September, 15·5 cm. in February, and 16·5 cm. in May, just before his death. The apex impulse may disappear at first only when the patient is lying on his back, reappearing when he lies on his side; but later on whatever his position. The cardiac sounds may alter, losing loudness and becoming shorter, and the first sound may become impure from incompetence of the mitral or tricuspid valve. Or the relative intensity of the aortic or pulmonary sounds may alter from a failure of one or other ventricle. The electrocardiogram may show progressive alterations.

In the majority of patients who have heart-block the block persists for the rest of their life, but this is not always so. We have already mentioned a case

FIG. 4.



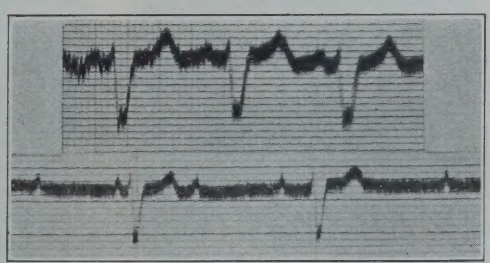
Electrocardiograms taken on July 4th, 1919 (above), and Oct. 10th, 1919 (below).

in which full heart-block only lasted for 24 hours. In another patient heart-block was present on August 3rd and had disappeared on the 10th. In the following case a full heart-block passed away to recur about two years later.

The patient is now aged 66, and works all morning in his office. He had always been a healthy man, save for an attack of dysentery on the Peninsula in 1915. In 1919 he had an attack of shortness of breath at a picnic, and again in 1923 when rolling the lawn, having to lie down on both occasions for some minutes before he recovered. In 1924 he had an attack of pain in his chest when riding. During the winter of 1924–25 he complained of shortness of breath upon exertion, but continued at his work. On May 7th, 1925, he went to a cinema, and when returning home nearly died from cardiac failure while climbing up the stair of a tram-car. When seen shortly afterwards he was very collapsed, with a regular feeble pulse of 44. He made a slow recovery. In the summer of 1928 he had an attack of dysentery which kept him in bed for a few days. In September, 1929, he had an attack of influenza, and two months later fainted when in his office. Otherwise he has been in comfort, working in his office and taking little exercise.

The changes of rhythm have been striking. A polygraph tracing on May 11th, 1925, showed full heart-block, and an electrocardiogram on March 26th, 1926, showed a similar rhythm. On Sept. 6th, 1927, a 2–1 block was present. On Feb. 28th, 1929, the rhythm was normal save for some

FIG. 5.



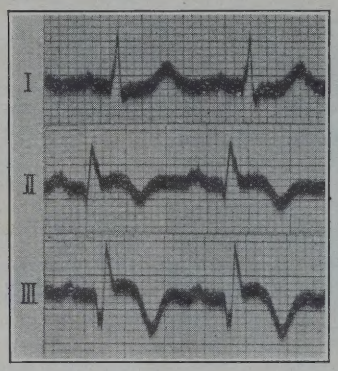
Bundle branch block on Nov. 24th, 1928 (above) and full heart-block as well on Dec. 14th, 1928 (below).

auricular extrasystoles, but on Jan. 6th, 1930, full heart-block was again present, having apparently recurred at the time of the syncope in November, 1929, as the pulse which in September had been running at 80 was then found to number 40 (Fig. 3). The variations in his blood pressure are very interesting. In 1926, when the block was full, it measured 215–70 mm.; in 1927, with the 2–1 block, 175–70 mm.; in 1929, with a normal rhythm, 160–110 mm.; and in 1930, after the return of the full block, 240–94.

Bundle branch block, too, may occur under similar conditions. An old man who was in the wards suffering from full heart-block with Adams-Stokes symptoms showed a full heart-block in July. During the autumn he was evidently slowly failing, and in October a routine examination showed right bundle branch block as well (Fig. 4). (You must use the wet fly if you wish to catch bundle branch block!) The opposite sequence was detected in an old lady who was suffering from recurrent syncopal attacks, due to coronary disease. The electrocardiogram of Nov. 24th showed left bundle branch block, while that of Dec. 14th showed as well full heart-block (Fig. 5).

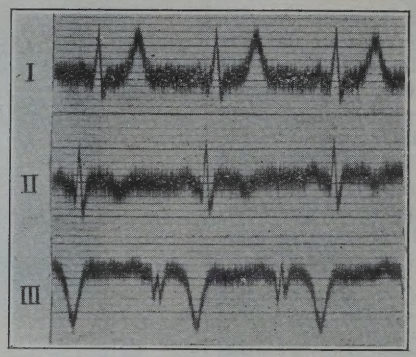
But the most common changes are in the ventricular complex.

FIG. 6.



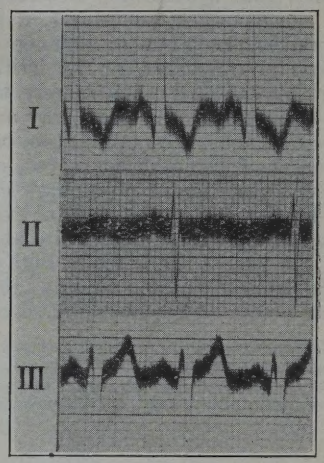
Electrocardiograms taken ten days after an infarct, showing deviation of R–T in leads II. and III.

FIG. 7.



Inversion of T in lead III.

FIG. 8.



Inversion of T in lead I.

ELECTROCARDIOGRAM IN MYOCARDIAL INFARCT.

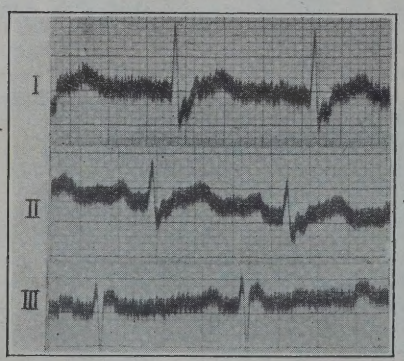
The changes in the electrocardiogram have been studied most fully in cases of myocardial infarct, but serial records, with post-mortem examinations, are still too few for accurate deductions to be possible. The following account is based upon the recent paper by Rae Gilchrist and Ritchie.

The early changes in infarct are usually shown as a deviation of the R–T segment from the iso-electric level. The deviation may be upwards or downwards, the direction in leads I. and III. being opposed. In the course of a few days or weeks the curve alters, negative T waves, which may be of exaggerated size, appearing, running out of QRS without any iso-electric period. The subsequent changes are in the direction of normal, which may be attained, or a negative T may persist indefinitely. But, as Gilchrist and Ritchie point out, R–T deviation may occur in various toxic conditions, such as digitalis and antiarin poisoning, in perfusion with variations in pH, in uræmia, and asphyxia. Moreover, T may be affected by emotion, exercise, exposure to heat or cold, digitalis poisoning, and preponderance of the left ventricle. In the absence of these factors, however, changes of the kind described are indicative of myocardial lesions. An abrupt onset points to infarct, an insidious onset to fibrosis.

These changes, too, are not invariably present in cases of myocardial infarct; R–T deviation was not present in 41 of 93 cases of their series, and T was not inverted in eight of 25 cases of coronary sclerosis confirmed by post-mortem examination.

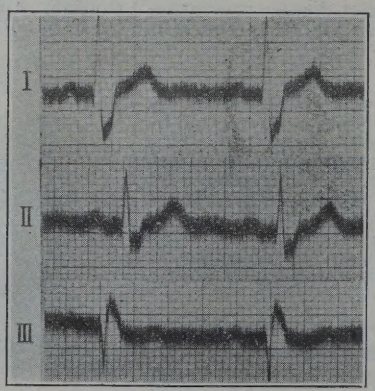
Personal experience coincides with Gilchrist and Ritchie's conclusions, for in 12 cases of gross myocardial damage, examined post mortem, the electrocardiogram failed in 4 to reveal characteristic changes. Changes are, however, often striking. Fig. 6 shows R–T deviation in leads I. and III. two

FIG. 9.



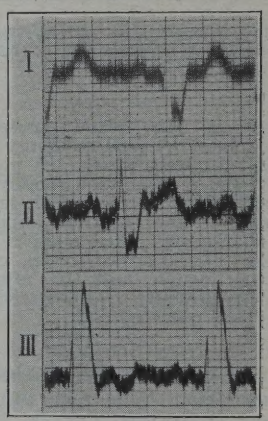
Note the abnormal QRST deflexions.

FIG. 10.



Note the abnormal QRST deflexions.

FIG. 11.



Note the abnormal QRST deflexions.

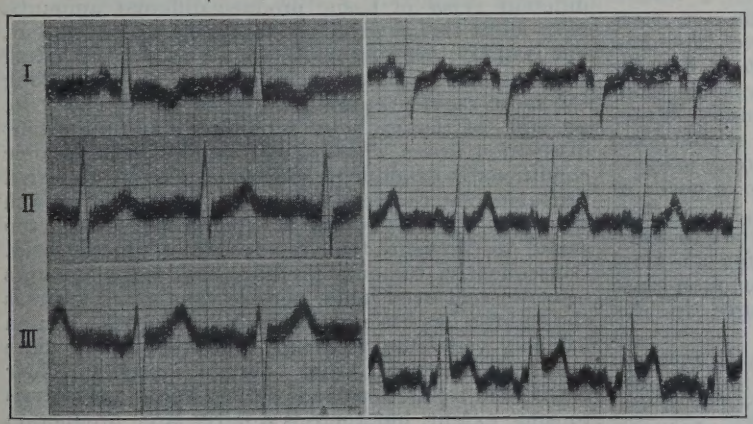
months after an attack of acute dyspnœa, during which the pulse for a time failed completely. Fig. 7 shows notable inversion of T five weeks after an attack of acute thoracic pain accompanied by great cardiac weakness, which had ensued on exertion. Fig. 8 shows well-marked inversion of T, in the opposite direction, three months after an attack of acute thoracic pain and breathlessness which had awakened the patient from his sleep. Fig. 9 shows other changes, associated with broadening of QRS, obtained five months after the onset of "tightness" of the chest upon exertion, followed a couple of months later by a full attack of angina. Fig. 10 was obtained from a man who three weeks previously, on a hot summer day, had suddenly become very giddy. The giddiness persisted. Fig. 11 was obtained from a woman who had had an attack of shingles and was found to have a mitral systolic murmur.

Fig. 12 shows a not uncommon alteration of lead III.

The patient first came under observation in 1925, when he complained of shortness of breath upon exertion which had succeeded a catarrh contracted some four months before. It seemed possible that he was suffering from whooping-cough, with which his children were at that time affected. The heart seemed normal on examination. In the summer he improved, and resumed his golf. In January, 1927, he again caught cold, and his breathlessness returned. He was confined to bed for a week, and on his return to business found that he was very short of breath upon even trivial exertion. The electrocardiogram now showed definite R–T deviation, most distinct in lead III. Otherwise the heart seemed quite normal. He refused to take care, and went a golfing holiday which confined him to bed for ten days. Return to business again produced an exacerbation of his discomforts, and he had to return to his bed. One evening he complained of some discomfort or pain in the epigastrium, which persisted next morning. But he sat up in bed dictating letters, and suddenly fell back dead.

We have watched somewhat similar electro-

FIG. 12.



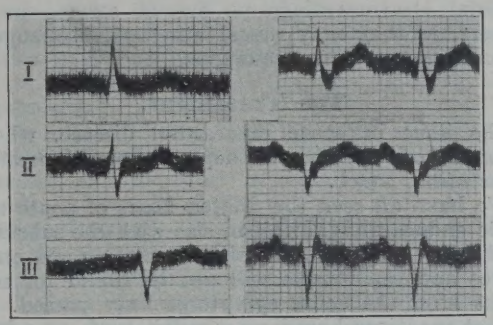
17.iv.25. 8.ii.27.
Changes in the electrocardiogram.

cardiograms developing insidiously during a period of two years before the death of the patient. Fig. 13 shows a change in the electrocardiogram of a case of angina, where health is apparently stationary.

The Prognosis.

The prognosis in myocardial disease is extremely difficult. The majority of patients die shortly after the first onset of definite symptoms of cardiac distress, some, indeed, coincidently with the first occurrence of the lesion (infarct). But some recover their health and activity in greater or less degree. One patient died at the age of 70, in full heart-block of syphilitic origin, which W. D. Macfarlane states occurred 30 years before his death. Another, as already narrated, is still at work five years after the occurrence of his first full block. Another patient who had had a partial block of insidious onset worked for nearly

FIG. 13.



2.vii.29. 12.v.30.
Changes in the electrocardiogram.

five years subsequently until his death from apoplexy. Similar records are available in cases of bundle branch block. One of our patients whose block had had a sudden onset died three years later from apoplexy, the intervening years being free from cardiac discomforts. Another, whose block had ensued simultaneously with aortic valvular disease during an attack of acute rheumatism, lived for seven years, while another patient, an alcoholic, who presented Cheyne-Stokes breathing at the time of observation with albuminuria, a high blood pressure, chronic bronchitis, and an ankylosed hip, lived for more than seven years subsequently.

The results in infarct, too, are sometimes very satisfactory. One of our patients lived for more than seven years, working hard for more than five of these years. Two others remained at work for about five years, another for four, and another still plays golf five years after his myocardial "insult" was recognised. Four at least of the cases of insidious onset lived for more than four years after its recognition, and one is still at regular work.

The lesions which are due to myocarditis, whether temporary or permanent, are perhaps the most satisfactory, though they vary as the cause is rheumatic or "bacterial," and with the probability or the reverse of a recurrence of the active process. The outlook in syphilitic cases is always hopeful as in visceral syphilis elsewhere, if appropriate treatment is possible, but too much must not be expected. The causal lesion is usually an endarteritis but occlusion of the vessel is generally due to thrombosis, which, as Gowers pointed out many years ago, is not a specific lesion, and so not amenable to specific treatment. Necrotic tissue cannot be revived. But specific treatment can open out the lumen of affected arteries in the neighbourhood, and so improve the nutrition and augment the functional activity of the parts at the periphery of the primary lesion. Atheromatous lesions cannot be dissipated, though the progress of

the sclerosis can be delayed. But it has been clearly shown by many observers, and recently by Campbell with injected hearts, that, given time, extremely efficient anastomotic developments are possible, particularly if the process of the narrowing is slow, a conclusion which has been corroborated by many clinical observers. The danger of sudden death, however, remains.

Serial electrocardiograms are of service in this respect, as they may reveal progressive changes or a continuance of the status quo.

The Treatment.

The issue in acute myocardial disease, whether inflammatory or ischæmic, depends upon *the treatment of the initial attack.*

We have all seen the dilated heart of acute rheumatic endocarditis shrink in size with the subsidence of the fever and the arthritis, but the scars on the valves and the muscle will not be sound for many weeks after the acute symptoms have passed. We cannot predicate how long it will take for resolution to be complete, for we know that in pneumonia, for example, the rate of resolution of the lung varies greatly from causes of which we are seldom cognisant. The only safe plan is to play for safety and maintain rest for several months after the acute symptoms have passed. We keep these rheumatic patients in bed for at least two months after the pulse-rate and the temperature have returned to normal, and even for a longer period if the patient's general health does not seem to be restored.

A similar line of treatment affords the best results in infarct. The rest *must* be absolute at first. We have known several patients die on the night stool, and more have serious syncopes. Restlessness must be combated by sedatives, and by opium if necessary. Rest in this case, also, must be continued for many weeks.

The chronic cases of insidious origin are more difficult to treat, but here, again, we have had satisfactory results from an initial rest in bed for several weeks, thus permitting anastomotic developments to proceed before throwing any undue strain upon the affected muscle. Massage of a mild kind is often useful at this stage. When exercise is again permitted care should be taken that it is never of such a kind as produces *any* discomfort, the patient being warned not to fight his troubles, but to learn how to circumvent them. The need for an amyl capsule should be prevented by the common-sense accommodation of the patient's desires to his limitations.

A syphilitic origin indicates specific treatment; while every effort should be made to improve the general nutrition and to maintain the value of the blood, particularly if the channels of the blood stream are narrowed. Symptoms of cardiac failure require treatment of the usual kind.

We have great pleasure in acknowledging the kindly assistance of many friends; in particular, J. L. Anderson, G. B. Fleming, A. S. Henderson, J. A. MacWilliam, W. D. Macfarlane, J. Muir, W. T. Ritchie, W. Roxburgh, J. F. Somerville, A. Tindal, and Farquhar Macrae.

A NOTE ON THE METABOLISM OF TUMOURS.

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FOR many years a search has been made to find some differences between the chemical changes occurring in normal and malignant tissues which might throw some light on the problem of tumours. Are there any chemical reactions characteristic of tumour tissue which may distinguish it from normal body tissues? Of the many attempts which have been made from time to time to answer this question, at present there appears to be only one striking series of discoveries which may be regarded as firmly established. These have resulted from the work of Otto Warburg and his collaborators.[1]

This group of workers has devised specially sensitive methods for studying the metabolism of isolated tissues in vitro, as a result of which they were able to show that the metabolism of the tumour cell is made up of two distinct phases: (1) respiration; (2) glycolysis—i.e., the breakdown of sugar into lactic acid *without* consumption of oxygen.

Very soon after the discovery by Otto Warburg of glycolysis by tumour tissue, it became clear that the property of glycolysis is widely distributed among animal tissues. In the absence of oxygen all animal cells produce lactic acid from carbohydrate, though different types of tissue produce different amounts. Most adult tissues glycolyse to a very limited extent, but rapidly growing cells of all kinds, including tumours, have a high glycolysis, and broadly speaking the more rapidly growing the tissue the greater the amount of lactic acid produced. An important distinction arises when the glycolysis under aerobic conditions is examined. For some time it appeared probable that the characteristic of malignant growth was that the respiration of tumour tissue was too small to prevent the appearance of lactic acid. Consequently, tumours produce very large amounts of lactic acid even under aerobic conditions, whereas the embryo has little or no aerobic glycolysis. Benign tumours were found to occupy a position intermediate between malignant and normal growth. Their respiration is sufficient to lower the aerobic glycolysis to some extent, but there is a fairly large production of lactic acid aerobically.

Later work made it clear that this classification was untenable. Many important cases of malignant tumours with a high respiration have been recently described. The effect of this high respiration on glycolysis is very variable. In some examples —e.g., some of the spontaneous mouse tumours studied by Murphy and Hawkins [2]—it caused the complete disappearance of aerobic glycolysis. In

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other instances in spite of the large respiration the greater part of the glycolysis persists aerobically. A number of interesting articles of this have been carefully studied by Crabtree [3] and confirmed by Warburg.[4]

In order to reconcile these diverse facts it is necessary to make certain assumptions which do not appear at present to be quite satisfactory. In particular, it is necessary to postulate that in some tumours, however large the respiration may be, it has lost the power normally present in all tissues of removing a definite amount of lactic acid. During an investigation by us of tissue metabolism, the detailed account of which is in the course of publication, some important new facts appeared which are intimately connected with the general aspects of this problem. Those points of our investigation which have a direct bearing on the problem of tumour metabolism are briefly recounted below.

Oxidative Metabolism of the Tissues.

Whilst glycolysis is concerned solely with carbohydrate the same cannot be said of the oxidative metabolism, which is in many cases divided between carbohydrate, fat, and protein. The questions which we set out to decide were (*a*) what is the proportion of carbohydrate used in oxidation by various normal and tumour tissues? and (*b*) does the proportion of carbohydrate used in oxidation bear any relationship to the known power of the tissue to form lactic acid from carbohydrate?

It has not previously been possible to give any decisive answer to these questions, because for technical reasons suitable methods for the sufficiently accurate measurement of respiratory quotient in highly glycolysing tissues were lacking. A method has now been arrived at which has enabled us to determine the respiratory quotient (R.Q.) in normal and glycolysing tissues with a maximum error of 0·02. By the application of this technique the above questions can be answered with considerable exactness.

Normal Tissues.—In a series of normal tissues examined by this method the value of R.Q. showed a definite and consistent relationship to the value of anaerobic glycolysis determined under similar experimental conditions. This is at once evident from the figures given for normal tissues below. In this Table the value of the R.Q. is compared with the measurements of lactic acid formed per hour anaerobically, the latter being expressed as a percentage of the dry weight of the tissue. All the values in this Table represent the mean of a number of determinations, all of which were consistent. Hence in normal tissues the increase in the ability to oxidise carbohydrate, as shown by the increasing value of the R.Q., runs parallel to the extent of anaerobic breakdown of sugar to lactic acid by the various tissues.

T.	R.Q.	A.L.A.	T.	R.Q.	A.L.A.
Liver	0·78	1·2	*Crocker sarcoma (mouse)**	*0·88*	*8·7*
Kidney	0·86	1·2	*Spindle-cell mouse tumour**	*0·91*	*9·0*
Intestinal mucosa	0·85	1·6	*Tar carcinoma (mouse)**	*0·87*	*9·5*
Submaxillary	0·87	2·7	*Mouse sarcoma 37S**	*0·86*	*10·6*
Spleen	0·89	3·2	*Rous chicken sarcoma*	*0·92*	*12*
Testis	0·94	3·2	Chorion	1·02	13
Embryo	1·04	3·5	*Jensen sarcoma*	*0·83*	*14*
Spontaneous mouse tumour I.	*0·87*	*6·4*	Retina	1·00	35
Slow growing sarcoma	*0·94*	*7·0*			
Chicken embryo	1·00	7·3			
Brain cortex	1·00	7·6			
Spontaneous mouse tumour II.	*0·91*	*8·2*			

T. = Tissue (rat tissues unless otherwise stated). R.Q. = Respiratory quotient. A.L.A. = Anaerobic lactic acid per cent. of tissue weight per hour.

* We wish to express our thanks to Dr. J. A. Murray, F.R.S., Imperial Cancer Research Fund, for these tumours.

Tumour Tissue.—If the figures given in italics in the Table are now considered, it will be observed that the values for the R.Q. of tumour tissue are always definitely below unity in the fairly representative collection measured up to date. All the tumours formed very large amounts of lactic acid anaerobically.

It therefore follows that in spite of the high *anaerobic* catabolism of carbohydrate, the ability to oxidise this foodstuff is definitely defective in tumours.

Human Tumours —The majority of human tumours, unlike the tissues reproduced in Table I., contain variable proportions of tumour cells mixed with normal tissue and rarely approach the high content of tumour cells found in transplanted tumours. Consequently, the lactic acid produced per unit weight of tissue is less than for the tumour tissues in Table I. The figures are therefore not included in the above Table, but two examples are given below, from which it will be seen that the same abnormally low respiration of carbohydrate occurs.

Human Tumours.	R.Q.
Carcinoma of breast	0·84
Papillocarcinoma of bladder	0·87

Discussion of the Above Table.—Considering first the normal tissues, our results do not support the apparently somewhat prevalent view that most normal tissues when given a sufficient supply of sugar utilise mainly carbohydrate. On the contrary, a number of normal tissues have, under these conditions, a mixed oxidative metabolism. These are the tissues with low anaerobic glycolysis. On the other hand, all highly glycolysing normal tissues have a carbohydrate respiratory quotient. This group includes retina, which has proved a serious exception to all previous attempts to classify animal tissues on the basis of their metabolism.

The correctness of Bohr's hitherto unconfirmed observation, made in 1900, that the embryo has a quotient of unity is proved by the above experiments. In general, therefore, young growing normal tissues are distinguished from most adult tissues by (*a*) their high anaerobic glycolysis, and (*b*) their high respiratory quotient. In other words, normal growing tissues have a high carbohydrate metabolism, not only in the absence of oxygen but also aerobically.

Turning to the metabolism of tumours, it will be seen from the above classification that their position is definitely abnormal. Their rate of growth and their glycolysis resemble that of the embryo, whilst their respiratory quotient is that of the adult tissues.

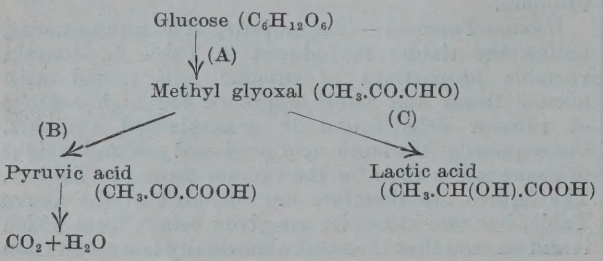
This investigation is now being extended to other representative types of pathological growth. This is obviously necessary before it can be stated how far this defective oxidation is limited to malignant tumours. We have, however, obtained some indication that similar metabolic damage may be associated with certain other types of pathological growth.

Nature of the Defective Oxidation.

These facts show that in tumours the oxidation of carbohydrate is damaged in some way, whilst their anaerobic metabolism is unaffected. The question

arises as to what is this defect in the oxidation in tumours. In view of the fact that the insulin content of tumours has been shown to be low in comparison with that of most normal tissues,[5] one might expect that this fact might give a clue to a possible solution of the problem. However, the part taken by insulin, if any, is in this case not a simple one, since the addition of insulin to isolated tumour tissue does not affect its oxidative metabolism to a measurable extent.

It is impossible to carry the analysis of the oxidative defect in tumours further without considering the intermediary metabolism involved in glycolysis and respiration. The question is a difficult one, but probably the reactions shown in the following simplified scheme are of importance.



According to this scheme, from which many stages not essential for the present discussion have been omitted, the molecule of hexose is first split into two molecules of triose—very probably methyl glyoxal or its hydrate. In the absence of oxygen this three-carbon chain is not broken down further, but appears as lactic acid. In oxygen, a part of the triose is oxidised via pyruvic acid, finally to CO_2 and water.

Two types of carbohydrate metabolism may now be distinguished on the basis of our measurements.

Type 1.—The velocity of the changes in stage A controls the carbohydrate metabolism—aerobic and anaerobic. This is the case of normal tissue with low glycolysis and consequently low R.Q.

Type 2.—The velocity of the changes occurring in stage B is diminished. In this case a high glycolysis indicates the unaffected course along routes A and C, whilst a low value of R.Q. indicates damage to the reactions occurring by route B. This is the case in tumour tissue.

Support for this theory is given by three further important facts which the method used enabled us to establish with certainty. (1) Addition of lactate to the medium causes an increase in the respiratory quotient of tissues of type 1 (e.g., liver). Hence tissues belonging to this group can utilise metabolites having a three-carbon chain. (2) Addition of lactate to tumour tissues causes no change in the R.Q. (3) Addition of pyruvate to either normal or tumour tissue causes an increase of the R.Q. to over unity (theoretical R.Q. for pyruvic acid = 1·20). Hence both types of tissue can attack pyruvate, and in the case of tumours the break in the oxidative route B must occur between the methyl glyoxal and pyruvic acid.

Summary.—There is a definite deficiency in the oxidation of carbohydrate by tumour tissue.

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REMOVAL OF NON-MALIGNANT TUMOURS OF THE BREAST.

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The operation devised by T. Gaillard Thomas (sometimes called "plastic resection of the breast") for the removal of so-called "innocent" tumours of the breast deserves to be more universally employed.

Breast tumours displaying the stigmata of malignancy receive an appropriate radical extirpation, and to the technique of the operation anxious care is lavishly given. Those of known innocence, such as true adenomata or lipomata, are often removed without any consideration being bestowed on the psychological and æsthetic aftermath, which is left as a perpetual legacy to the patient. Even those, such as a cystic "mastitis," in which there is merely suspicion without real evidence of malignancy, may well be conceded a little more indulgence in the planning of the operation. Binnie [1] declares that in these cases the patient should "receive the benefit of the doubt and radical measures adopted"—that is, should be condemned to the radical operation forthwith. This counsel seems harsh and precipitate, ignoring the extremely severe character of the modern radical operation. A tumour which displays no evidence of malignancy on careful examination before the operation seldom shows sufficiently marked evidence, tactile or visual, during the course of the operation to warrant an immediate radical operation. The early or precancerous stage is detected only after careful microscopic examination by the pathologist, not by a hasty and cursory inspection during the course of the operation. The issues are too serious, the implications of the decision too far-reaching, for such cavalier methods. A cancer at so early a stage as to defy a careful physical examination beforehand will gain little further deadliness by the postponement of the radical operation for the few days necessary to establish a sure diagnosis by pathological examination.

In recent years fewer examples seem to occur of the enormous cysto-adenoma, neglected and allowed to progress until the whole of the mammary gland with its fatty envelope is hopelessly destroyed. A gross example would conceivably preclude any attempt to preserve even a ghostly image of the normal organ, and would compel an "amputation." So, too, those rare conditions of a progressive and destructive nature, such as tuberculosis, actinomycosis, and possibly gumma, demand effective extirpation of the whole organ, together with the overlying skin. Cosmetic considerations must yield to the necessities of the case, and usually a free removal by a lenticular incision is imperative. There remains a large class, including the simple adenoma, the so-called "interstitial mastitis," and intracanalicular fibro-adenoma, in the removal of which other considerations than the mere curing of the disease may well receive closer attention.

The adenoma, being an encapsuled tumour, can be effectively removed by a crescentic incision on the lower and outer margin of the breast, the whole organ being turned over and the tumour shelled out, after which the breast is replaced in its normal position and the wound sutured. An excellent description of this operation is given by Bickham,[2] the

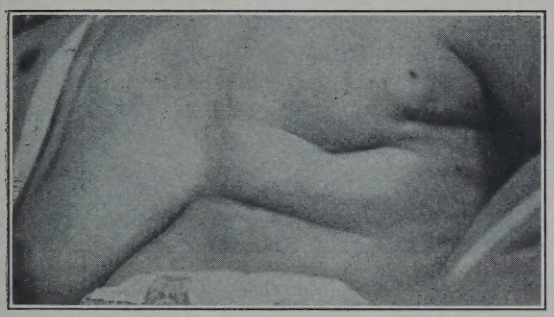
description following the account of the original operation devised by Gaillard Thomas and afterwards practised by J. C. Warren.

Chronic Mastitis.

Most of the cases calling for limited removal of the mamma are cases of "interstitial mastitis" or, more correctly, "desquamative epithelial hyperplasia" (Cheatle).

Unfortunately the convenient term "chronic mastitis," admirably terse and descriptive, is inaccurate. The

FIG. 1.



The result of an operation done several years ago for a simple tumour of the left breast in a young married woman; I was consulted as to the possibility of effecting some mitigation of the distressing deformity inflicted. For such cases Gillies [23] has devised an ingenious plastic operation.

deductions of Lenthal Cheatle from his searching investigations into the pathology of the disease have received general acceptance, but the nomenclature that he suggests [3] has proved too cumbersome to pass into current literature. In his Hunterian lecture Geoffrey Keynes [4] reviewed the evidence and showed that chronic mastitis, fibro-adenoma, simple cyst, and galactocele have in common these histological changes: "round-celled infiltration (lymphocytes), fibrosis, dilatation, epithelial changes of two kinds (desquamative and proliferative), and formation of papillomata." He gives good reasons for believing that these so-called diseases are merely manifestations of the same underlying pathological processes. It seems impossible to devise a nomenclature that will be accurate and fully descriptive, and it would simplify our conception of these diseases if they were grouped together under one title. "Hyperplastic disease of the mamma" would have the merit of being, so far as it goes, more accurate than mastitis. There is, indeed, much to commend the plan of labelling a disease of which the pathology is obscure or the manifestations protean by the name of one who has advanced our knowledge of it. There is possibly as much warranty for the title "Cheatle's Disease" as for that of Köhler, Banti, Legg, or Schlätter. It is curious that the term mazoplasia, suggested to Cheatle by Rolleston in 1924, has not passed into current use.

Whilst awaiting a solution of this debatable but comparatively minor problem, we can realise that there are certain features about this group of interesting diseases, alike at least in their innocence and in their inability to transgress the limits of the corpus mammæ, which have a bearing upon the operation designed to effect a cure.

In so far as operative treatment of a tumour of the breast is concerned, the growth is either malignant or innocent. If it be innocent, complete removal without fear of recurrence can be achieved with certainty and ease, and there only remains for decision the method that confers on the patient the least degree of mutilation.

The vicissitudes of belief regarding the pathology of the disease mazoplasia is evidenced by the rich but chaotic terminology quoted by Parker Syms.[5] Of the 11 variants which he gives, that of Sir Astley Cooper, "chronic mammary tumour," is the most satisfactory, being descriptive and non-committal. Acute divergence of opinion as to the presence of inflammation has existed; whereas Syms [6] declares "the disease is undoubtedly primarily an inflammation," Grant [7] shrewdly observes that "the gross appearance and symptoms at menstrual periods and during lactation savour far more of an inflammation or mastitis than do those seen in an average case of chronic mastitis," and concludes that the disease is an abnormal epithelial hyperplasia. An interesting observation by Rutherford Darling [8] is that "oöphorectomy leads to atrophy and to changes (in the breast) identical to those met with in chronic mastitis."

Similarly, there is disagreement as to the frequency with which cancerous changes can be detected in mammæ removed for mastitis; for whereas Bloodgood [9] examined 222 out of 350 mastitis cases at Johns Hopkins Hospital and declared that "not one showed evidence, gross or microscopic, of carcinoma," Ewing [10] states that "50 per cent. of breasts excised for cystic disease show pronounced precancerous changes or miniature carcinomas." Between these extremes we find: [12]

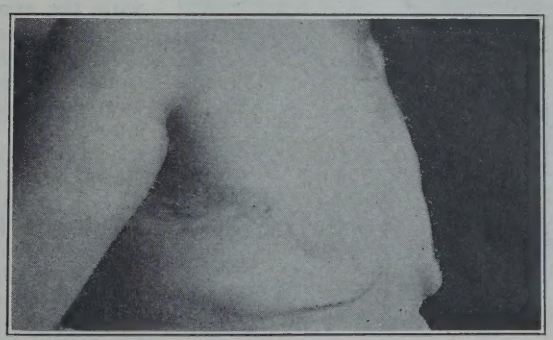
	Per cent.		Per cent.
Greenough and Hartwell	10	Lockwood	20
Warren	13	Finney	10–50
Verga (5 in 28)	18	Lahey[11]	10–50

Bloodgood,[13] however, adds that in 3 out of 128 where partial removal of the breast had been done carcinoma developed later. In my series there were 3 out of 60 cases—i.e., 5 per cent. It seems established that, when malignant changes do occur, the site may be at any point from the ampulla of the duct to the most distant acinus of the corpus mammæ—at any part of what may be termed the mammary tree.

Surgical Anatomy.

The female mamma consists of the true breast tissue—namely, the acini with their ducts (conveniently referred to as the corpus mammæ) encased in its fatty envelope (Stiles [14]). The approximate limits are from the second to

FIG. 2.



The result of an operation for "mastitis" in both breasts done at a large general hospital in London for a nurse who was then aged 21; a sensitive woman whose subsequent married life has been embittered by the (? unnecessary) mutilation.

the seventh rib vertically and from the edge of the sternum to the midaxillary line laterally; Spence's axillary tail runs up towards the axilla as high as the third rib. Stiles [15] also taught that the corpus mammæ is so intimately connected with the fibrous framework that the two cannot be separated, so that there is no capsule proper; the fibrous stroma is so broken up and branched at its periphery that it becomes directly continuous with the connective tissue framework of the fatty superficial tissue. The disposition of the fibrous scaffolding is beautifully portrayed in some of the older text-books.[16 17 18] In addition to the well-known suspensory ligaments of Cooper, fibrous processes pass from the deep surface of the gland to the pectoral fascia, sometimes even into the pectoral muscle, carrying with

them minute lobules of the gland. In the parous mamma at the end of lactation involution occurs, the corpus mammæ shrinks, and fat becomes deposited superficially and also on the deep aspect of the gland.

The blood-supply of the gland is derived from: (1) The second, third, fourth, and fifth perforating branches of the internal mammary. (2) Descending branches from the acromio-thoracic axis. (3) The principal supply comes by way of the long thoracic or external mammary branch of the axillary artery. (4) Small branches from the intercostals.

As each artery of supply approaches the margin of the gland proper it divides into two sets of branches, the one coursing superficially through the fatty envelope towards the nipple, and the other passing deeply into the substance of the corpus mammæ. This disposition, well seen by transillumination, influences the choice of the ideal incision for the operation of mastectomy—a term suggested by Grant.

The nerve-supply comes from: (1) Descending cutaneous branches of the cervical plexus. (2) Lateral and anterior branches of the second to the sixth intercostal nerves. (3) The gland itself (sensation), from the perforating terminal branches of the fourth, fifth, and sixth intercostals.

In addition there is probably a free supply of sympathetic nerves of whose course and origin nothing appears to be known, although it is highly probable that they follow the course of the arteries supplying the gland.

Operation.

For non-malignant tumours of the breast the operations necessary may be divided into three classes.

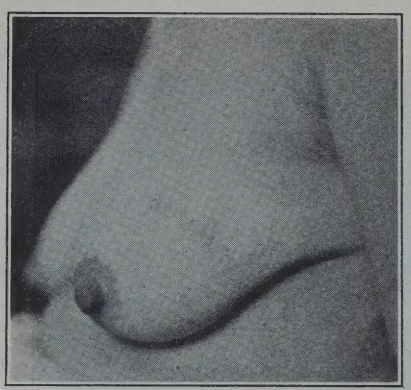
1. Actinomycosis and tuberculosis demand amputation with removal of the overlying skin, treating the disease as locally malignant.

2. Large innocent tumours such as advanced (so-called) cysto-adenoma and hydatid disease, where the whole corpus mammæ, together with its fatty envelope, has been destroyed, require a lenticular incision with preservation of as much of the overlying skin as is possible.

3. The majority (adenoma, fibro-adenoma, serous cysts, mazoplasia) need Thomas's operation and observation of the strictest conservation.

My interest has been centred on the last class and on the technique necessary to ensure the best cosmetic result compatible with the cure of the disease. "The operation is perhaps the easiest in surgery" (Binnie[1]). Considering the blood-supply, it is evident that the ideal site for the incision is in the lower hemisphere of the breast, and this corresponds with the site of election for cosmetic considerations. The incision advised by Warren[19] and recommended by Bickham falls upon the sulcus along the lower and outer circumference of the breast, whereas Fitzwilliams[20] says "I much prefer an incision extending well below the breast, whereby the breast is turned upwards and inwards, to that recommended by Warren, which was almost altogether on the outer side."

FIG. 3.



The result in a married multipara, a case of mastoplasia, aged 29. The scar has been marked with Indian ink.

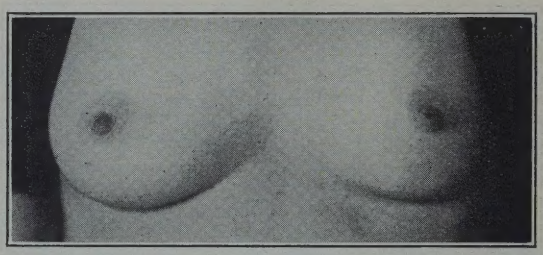
I have used both these, but find good reasons for the adoption of a crescentic incision through the skin over the lower and outer aspect of the breast itself about half an inch from the line of the sulcus. These reasons are:—

1. The skin is healthier and the resulting scar more nearly "invisible." Even a trivial low-grade sepsis, not infrequently regarded as negligible in wounds accounted "clean," mars the quality of the scar.

2. The main trunks of the arteries escape severance and the nutrition of the tissues that are left is more vigorous, so that there is less post-operative shrinkage and distortion. This applies specially to the nipple, which has been known to slough from lack of blood-supply—a mischance that has not, however, befallen any of my cases.

3. Greater accessibility to the upper and internal portions of the corpus mammæ, where outlying lobules are apt to be overlooked.

FIG. 4.



An unmarried girl of 24, from whose left breast an adenoma in the lower outer quadrant was removed.

In whatever part of the breast, then, the tumour may be, a crescentic incision is made on the skin of the breast itself, with its centre in the lower and outer quadrant; scratches are made at right angles to the line of the proposed incision to ensure accurate coaptation of the skin edges afterwards. The scalpel should be of the sharpest. The incision is deepened until the breast tissue proper is reached and then, keeping close to the corpus mammæ and preserving every scrap of fibrous tissue and fat, the lower margin is defined and the whole breast turned over, upwards and inwards in the way originally described by Thomas.

At this stage the enucleation of an encapsuled tumour (e.g., an adenoma) is done through a radial incision in the deep aspect of the corpus mammæ, but in the majority of cases of mastitis or mazoplasia it is necessary to remove the whole corpus mammæ. On the deep surface of the gland, especially in parous subjects, there is sometimes a thin layer of fat, which should not be removed. Occasionally, however, there is found a lobule of the gland which lies deep to the fascia covering the pectoral muscles, embedded in the muscle and connected to the main corpus mammæ by a narrow isthmus only. Unless the breast is turned over carefully such an outlying lobule may be left behind.

The most meticulous care is necessary in dissecting away the anterior surface of the gland; interlobular tongues of fat should not be sacrificed, nor the fibrous ligaments of Cooper, along which vessels and lymphatics run. The strand of tissue between the nipple and the corpus, consisting of the main ducts, is carefully isolated and severed close to its junction with the corpus mammæ.

Arrest of hæmorrhage should be very complete and achieved without including in the ligature a mass of surrounding tissue. Since the vessels are severed close to the gland the bleeding points are numerous, at least five or six on the inner side from the perforating arteries, two or three small branches from below derived from the intercostals. about three on the outer side from the external mammary, and two or three above from the acromio-thoracic.

A purse-string suture of fine catgut is often necessary to ensure eversion of the nipple, and a few sutures

sometimes help to refashion the fatty and fibrous remains in the image of a normal breast. A small 24-hour drain is sometimes advisable. The skin requires accurate and gentle suture with fine fishing-gut, and here we may keep in mind Lord Moynihan's [21] words.

"The cleaner and the gentler the act of operation the less the patient suffers . . . . the more exquisite his healed wound, and the happier his memory of the whole incident. . . . . The appearance of a wound is often the best index to the quality of the work that has been done throughout the operation."

To ensure the best scar, stitches should be removed on the fifth or sixth day.

PRESERVATION OF THE NIPPLE.

The psychological and æsthetic importance of the nipple to a woman is not readily appreciated by the masculine mind. Reduction in the size of the mamma, especially if the characteristic contour can be retained, she bears with equanimity, but the nipple is a sign-manual of her sex and spares her the stigma of "mutilation." Moreover, in the removal of non-malignant tumours, sacrifice of the nipple is more than undesirable—it is quite unnecessary. Tumours proper (e.g., adenomata) never involve that portion of a main duct which lies distal to the ampulla and which, traversing the nipple, is lined by squamous epithelium. The cysts of mazoplasia sometimes occur first below the musculature of the nipple but none within the nipple,[22] and are never so close to the surface as to involve ablation of the nipple. The cysts arise mainly from the portion of the ducts which lies between the ampullæ and the acini, rarely from the ampullæ themselves. The stretch of duct reaching from the surface to the ampulla can therefore be preserved with safety in all cases. It is noteworthy that the nipple thus left never becomes unduly sensitive, nor has the nutrition of the part ever been jeopardised in any of my cases.

Palliative Treatment.

The fundamental condition in so-called chronic mastitis has been shown by Lenthal Cheatle to be a "desquamative epithelial hyperplasia." Whether the formation of cysts is an inevitable ultimate sequel, certain it is that in a considerable percentage gross cysts do eventually develop, and in these cases palliative treatment can do little more than mitigate the severity of the pain. For the most part they are fated to come to operation, or to bear the penance of constant pain and dread of malignant disease. Nor does palliative treatment influence appreciably those complicated by the presence of adenoma or fibro-adenoma. There remains a residuum of early cases in which certain measures appear to arrest the pathological process and to dispel the disquieting symptoms.

The 60 cases recorded were treated between 1921 and 1929 and most were given a short course of treatment before operation was discussed. Even when operation is inevitable, a preliminary course of treatment serves to satisfy the patient that the dreaded operation is not being lightly undertaken. In a large number of cases, not recorded, perseverance with palliative measures sufficed to bring about a symptomatic cure and operation was unnecessary. The measures which have proved useful are the following:—

1. Inunction with iodex and radiant heat for 20–30 minutes proved efficacious in many cases.

2. Ultra-violet ray treatment (2 minutes increasing to 15 minutes) appeared to do good in some cases.

3. Hot bathing followed by centripetal massage often causes great relief of pain and diminution in the size of the tumour.

4. A mercurial ointment occasionally soothes pain and appears to diminish the swelling—*ung. hydrargyri* or *ung. hydrargyri oleatus*.

5. X ray treatment may be expected to arrest the morbid process, but the analogy with carcinoma is not sufficiently close to warrant high hopes. In a recent case, however, relief from pain has certainly been achieved. (? suggestion.)

6. In all cases firm bandaging or support by a well-fitting brassière is advantageous.

7. Probably the most efficacious weapon will be found in sun-baths. Only in a few of my cases has it been practicable to secure this, but in each case the benefit was unmistakable. It is said that in countries where women habitually wear no clothing above the waistline the disease is unknown; such a sweeping generalisation must be received with caution but my limited experience tends to confirm it.

Analysis of Cases.

1. The conservative operation as outlined above has been done in 50 out of 60 cases recorded for non-malignant tumours of the breast; in the remaining ten amputation was done. 2. The youngest patient was 20 years old and the tumour was a "fibro-adenoma." 3. The youngest case of mazoplasia was 23 years, the oldest 63 years. 4. Only five out of 60 were unmarried. 5. In every case over the age of 45 and in most of the others the whole corpus mammæ was removed; 12 of the 60 cases had a segment only of the gland removed, but of these three were cases of adenoma. 6. Forty operations were done on the left side, 21 on the right side; one case required removal of both breasts. 7. In the 50 conservative operations the nipple was preserved in every case and in none of these was there any untoward consequence. 8. The average age was 42·3 years. 9. The results are almost uniformly good. Sometimes a neuralgic pain, usually trivial, is complained of along the course of the descending branches of the cervical plexus, or sometimes along the distribution of the intercostohumeral. These pains are more common amongst the cases of mazoplasia in which a segment only of the gland has been removed, and the impression grows stronger that in this disease it is always the wiser course to remove the whole of the corpus mammæ. 10. In two cases the pathologist's report was "duct-carcinoma." In both these the radical operation was done later (1927 and 1928) and in both there is no sign of recurrence. In a third case the report was "carcinoma." The patient declined the radical operation and had a prophylactic course of X ray treatment. Nearly two years have elapsed without any evidence of recurrence or metastasis.

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EXPERIMENTAL OBSERVATIONS ON THE ACTION OF RADON ON THE SPINAL CORD.*

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EXPERIMENTS designed to determine the maximum dosage of radon that might be applied safely to malignant tumours of the central nervous system have disclosed a striking relation between the dose of radon and the time of appearance of symptoms of destruction of nervous tissue. Cats and monkeys were employed, and the spinal cord was selected for investigation since symptoms of its destruction can be quickly recognised; symptoms that follow destruction of the higher regions of the central nervous integration are not so easily observed, and are difficult to interpret.

Radon seeds of varying doses, but always 1·5 cm. long and screened by 0·3 mm. of platinum, were placed, with aseptic precautions, alongside the spinal cord in the lower dorsal region. This preliminary communication and the Table that follows are based on experiments in which the seeds were implanted outside the dura. The animals were carefully observed during the two or three weeks after operation, and several were studied for a period of four or five months.

One animal showed weakness of a hind extremity immediately after operation, and this was discarded, as the cord had undoubtedly been injured while the seeds were being inserted. In every other instance during the first 24 hours after operation there was no sign of weakness of the hind limbs or of loss of sensation. With an overwhelming dose of radon (e.g., 31 millicuries) signs of weakness of the hind extremities appeared 30 hours after operation. Except for loss of position sense no sensory disturbance could be detected at this time. The paraplegia always became complete three to four days after the onset of the first symptom, even though in some experiments the seeds were withdrawn 48 hours after they had been inserted. When smaller doses of radon were used the time of onset of the first symptom was later, and the appearance of complete paraplegia was correspondingly delayed. In cats any dose greater than 9·5 mc. produced complete paraplegia; with a dose of 9 mc. or less the paraplegia was incomplete or slight; and with doses of 4 mc. or less there were no obvious neurological symptoms at any time. Monkeys proved more resistant than cats, for a dose of approximately 12 mc. produced only slight weakness. The following Table gives a summary of our results.

The first symptom displayed by the animals after insertion of the radon was loss of position sense. This sometimes preceded by several hours the appearance of definite motor weakness. The animals invariably passed through a stage of extension before developing a characteristic complete flaccid paraplegia (in flexion), which was not unlike the paraplegia in flexion seen in human beings several weeks after a complete transverse lesion of the spinal cord. In two instances the animals remained permanently in extension and in these subsequent histological examinations showed that the dorsal quadrants were destroyed while the ventral regions remained largely unaffected.

Table showing the Effect of Increasing Doses of Radium Emanation upon the Spinal Cord (Applied Outside the Dura). Screening 0·3 mm. Platinum.

C.D.(M) = Corrected dose (millicuries).
W.K. (d) = Weakness (days).
Pp. = Paraplegia (comp., complete; incomp., incomplete).

C.D.(M)	W.K.(d).	Pp.	C.D. (M)	W.K. (d).	Pp.
	Cats.			*Cats.*	
31·3	1+	Comp.	6·6	6	Slight.
28·8	2	,,	6·3	6–8	,,
27·0	2	,,	3·7	None.	None.
24·7	4	,,	3·1	,,	,,
16·2	2–3	,,	2·8	,,	,,
16·3	4	,,	0·0	,,	,,
10·0	5	,,			
9·8	5	,,		*Monkeys.*	
9·2	5	Incomp.	11·8	3	Slight.
9·0	4	,,	9·0	None.	None.
7·3	8	Slight.	6·1	,,	,,

In these experiments the radon seeds were applied to the dorsal surface of the cord, and the destruction proceeded in a ventral direction, the posterior columns being affected first and the ventral tracts last. We believe that the period of extension is one in which the posterior columns and possibly other structures in the dorsal quadrants of the cord are impaired while the ventral quadrants are normal. Further work is being done on this problem. Full details concerning the pathological character of the lesions and the degenerations will be published later.

We desire to thank Prof. Sidney Russ for supplying us with radon, and for his help and criticism. The expenses of the work were defrayed by the Charles Bingham Bolton Fund for Neurology.

* A paper read before the Society of Neurological Surgeons on Nov. 23rd, 1929.

RELATIVE VALUE OF VARIOUS SOLUTIONS FOR SCLEROSIS OF VARICOSE VEINS.

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THE ideal solution for injection of varicose veins has not yet been found. A list of the various solutions in common use at the present time is set out below, and the advantages and disadvantages peculiar to each are discussed.

The susceptibility of veins to a sclerosing injection varies from individual to individual, and this personal element can neither be eliminated nor ignored. My generalisations are drawn from observations on different series of patients extending over a period of four years. The total number of injections given amounts to 4000, and they have been divided into four groups according to the drug used.

FOUR SCLEROSING AGENTS.

1. *Glucose.*—Up to 5 c.cm. of a 66 per cent. solution was injected at a time. The advantages of this solution are that the substance injected is innocuous and does not cause any systematic disturbance. It produces clotting over large areas of vein, but the clot tends to be a loose one. The

treated vein is tender to touch for a period of five to six weeks ; it looks red for two weeks or more. There is a tendency for the clot to break up, and of the recorded instances of pulmonary embolus resulting from vein injection the majority have occurred following the use of glucose (Olson,[1] Levi [2]).

2. *Sodium Salicylate.* — Solutions of several strengths are used, the choice depending on the susceptibility of the vein treated. It is usual to start with a relatively weak solution and work upwards. The advantages of this substance are that it produces a limited sclerosis and causes obliteration of two or three inches of vein wall. The resulting clot is firm and incorporated with the vein. There are, however, several disadvantages attending the use of salicylate. The first is that the injection is painful and accompanied by cramps in the calves. If the injection is made into subcutaneous tissue gangrene, followed by ulceration, nearly always occurs. Sometimes the injected fluid leaks back through the puncture made in the vein wall by the needle. Even a small quantity of salicylate in the tissues will act as an irritant. Quite a large percentage of patients do not "take," and have to be given numbers of injections of increasing strengths. In at least two of my patients recanalisation of the sclerosed vein occurred within 18 months of the time of injection. Salicylate solutions go brown on keeping. Attempts have been made to overcome the cramps produced by adding local anæsthetics to the salicylate solution ; the most popular preparation is lithium salicylate with the addition of tutocaine.

3. *Quinine and Urethane.*—2 to 3 c.cm. were injected at each sitting. The quinine is the active element and it destroys the endothelium of the vein ; the urethane is added for its anæsthetic properties. The great advantage of this preparation is that it usually "takes" and consequently there are very few refractory veins, and the total number of injections is thereby reduced. It is painless at the time of injection, but there is often a complaint of cramp five to six hours afterwards, especially if the patient has been sitting for any length of time, and gets up suddenly. The pain rapidly passes. The reaction induced by the quinine is a severe one, and sometimes the whole saphenous vein will become filled with clot following one piqûre. This clot remains red and painful for six weeks or so. In a small minority of people dizziness is apparent at the time of injection, and in women some disturbance of menstruation has been observed. The tissues are very intolerant of the injection, and a slough taking weeks to separate, leaving a slowly healing ulcer, is the invariable accompaniment of faulty technique. If a thin-walled vein is injected the sclerosing action is so severe that I believe the vein wall becomes permeable and the injection leaks through. Some of the sloughs appearing three to four weeks following treatment are possibly due to this cause, and are not always the result of a subcutaneous injection.

4. *Sodium Morrhuate 5 per cent.*—This substance was used extensively years ago, and was the chief constituent of a very famous cancer "cure." It was also administered, as a 2 per cent. solution either intramuscularly or intravenously, for tuberculosis. Its main disadvantage was the thrombosis which followed the intravenous administration, and on account of this the treatment fell into disrepute. Sodium morrhuate is much less irritant than salicylate or quinine, and does not produce sloughing if injected into the subcutaneous tissues. The reaction it produces in the vein is much less severe than quinine. The injection is almost painless and the discomfort afterwards is not great. I have not seen an ulcer following an injection of sodium morrhuate. Most of the patients treated reacted to the first injection. There is not the same tendency to extensive clot formations as there is with quinine and urethane. No general toxic symptoms have been observed.

VALUE OF THE TREATMENT.

From perusal of the vast literature of this subject I have formed the following conclusions.

Mortality is due almost entirely to pulmonary embolus. McPheeters and Rice [3 4] record seven deaths among 53,000 patients, Kilbourne [5] one in 5000, and Dixon five in 5400. The risk, therefore, is small—much smaller than the operative mortality, which is 0·4 per cent. There were three main causes of the recorded fatalities : the first was the injection of veins in the presence of an acute phlebitis ; the second was the injection of a sugar solution, which resulted in three deaths, McPheeters and Rice [4] ; while the third was the use of large quantities of injection material. Hohlbaum [6] used 60 c.cm. of an iodine solution. Therefore if sugar solution is avoided, if the total bulk of chemical injected is under 5 c.cm., and if the injection is not given with coexisting acute phlebitis, the treatment appears absolutely safe. There is no recorded death from pulmonary embolus, the direct result of treatment on these lines.

Recurrence is sometimes caused by recanalisation of the injected vein. More often it is due to new varicose veins appearing. It follows operative excision in 30 per cent. of patients, but in those injected it is only 6 per cent., according to Kilbourne, and 5 per cent. according to Sicard. My figures agree more with Sicard's, though the total number of patients is small, especially when compared with that of Sicard, who had 15,000 patients and has given them 120,000 injections. Recurrence, however, is a minor complication, which may be treated by reinjection.

Chemical gangrene follows the injection of substances into the subcutaneous tissues. Payne [7] records 13 instances in 1500 patients, Higgins [8] 12 in 200 patients. That this is not always the result of faulty technique I am quite sure. Kilbourne recognises that it is sometimes due to leakage through the puncture made by the needle in the vein wall. McPheeters and Rice suggest that sometimes the injected material osmoses through a thin vein. This complication can, however, be overcome by :—

1. The use of a needle with a short bevel and a moderately small bore.
2. The withdrawal of blood before injecting the chemical.
3. The retention of the needle in the vein for a minute or two following the injection.
4. The application of a small wool pad fixed with strapping or bandage rather than the use of a collodium dressing.
5. The use of sodium morrhuate if a thin-walled vein is to be injected rather than quinine and urethrane or salicylate which produce a severe reaction in many patients.

Refractory Veins.—Angle,[9] in America, injected 10 c.cm. of a mixture of sugar and sodium chloride into one individual 25 times, and repeated the operation 27 times in another. Such persistence is to be deprecated. It is better to change one's technique if a vein does not become obliterated following one or two injections into it. It has been my experience that if quinine and urethane is used, and the injection made when the patient is in bed in the evening, the vein will be thrombosed on waking in the morning. Injection should be made with the leg horizontal in bed. No tourniquet is used, and the patient is enjoined not to move for an hour after the treatment.

This technique is only followed in patients who have proved refractory.

Pigmentation along the site of the thrombosed vein is common and sometimes permanent, but it becomes progressively less over a period of 18 months.

Contra-indications may be summarised as (1) acute phlebitis. Forestier,[10] quoted by Sutton, says that "no injection should be given for ten years following phlebitis." About half of the recorded deaths following injections have been due to this dictum having been disregarded. (2) Intermittent claudication. (3) Deep thrombosis, due to any cause. (4) Phlegmasia alba dolens (Takats [11]). General diseases, such as cardiac and renal disease, are not contra-indications except during their terminal stages. Injection is safe in pregnancy, but during the latter months it appears advisable to wait till after delivery of the child. Varicose veins of the vulva react as well as varicose veins in other situations.

I should like to thank the surgical staff of St. Mary's Hospital, Paddington, and Mr. Laming Evans, for allowing me to include observations made from their patients.

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CLINICAL AND LABORATORY NOTES

TWO CASES OF GLANDULAR FEVER SIMULATING TYPHUS.*

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MEDICAL SUPERINTENDENT, WESTERN HOSPITAL, LONDON COUNTY COUNCIL.

CASE ONE.

ON March 27th one of us (M. R.) was asked by a practitioner to see a girl, aged 16, who had been taken ill suddenly on March 21st, and on the 25th had had a well-marked blotchy rash which the doctor thought suggestive of typhus. The early symptoms were headache, nausea, pains in the back and legs, and a general feeling of illness. On the 27th the rash had faded considerably, but was still visible. The temperature in the axilla was 102° F. The skin also showed some bites probably due to lice. Under the circumstances it seemed advisable that the case should be regarded as one of typhus and that the patient should be removed to a fever hospital. By a coincidence, J. D. R., in connexion with a discussion on tropical typhus to be held on the following day,[1] rang up the chief office of the Metropolitan Asylums Board shortly after the case had been notified to inquire about the last cases of typhus reported in London.[2] He was, therefore, only too pleased to accept the suggestion that the case should be sent to his hospital.

On admission to the Western Hospital on March 27th the girl showed a faint macular rash on the face, chest, and abdomen. The tongue was thickly coated. Some rhonchi were heard at the base of both lungs. The patient looked ill but was quite sensible. Temperature 104° F., respirations 32, pulse 106. There were numerous lice on the body as well as in the scalp.

For the next ten days the temperature remained at a high level and then began to assume an intermittent type which persisted until April 27th, when a normal level was finally reached. The patient was at first very drowsy and difficult to rouse but remained sensible and showed no signs of delirium. For a few days she suffered from retention of urine. The diazo reaction in the urine was persistently negative.

The true nature of the illness was not suspected until April 12th, the twenty-fifth day of disease, when the glands in the posterior triangle of the neck became enlarged and painful, and four days later enlargement of the axillary and inguinal glands was detected and a slight increase in size of the spleen. The possibility of glandular fever then first suggested itself and a specimen of the blood was sent to Dr. J. E. McCartney, Director of Research and Pathological Services, M.A.B., who made the following report:—

"Differential count: polymorphs 34 per cent.. large lymphocytes 56 per cent., small lymphocytes 9 per cent., large mononuclears 1 per cent., eosinophils and mast cells nil. The above results show that there is a relative increase in the number of lymphocytes, particularly the large lymphocytes, some of which have a few small red granules in the protoplasm. The polymorphs show signs of immaturity. There is hardly a multilobed cell to be seen, and in many the nucleus is merely horse-shoe shaped. One or two neutral myelocytes were seen. The red cells vary in size, but there is no poikilocytosis. One nucleated red cell was seen. No punctate basophilia was observed. No parasites—i.e., spirochætes or malaria organisms—were seen. The total cell count is not known but the blood picture shows the appearance of a case of acute glandular fever (infective mononucleosis)."

The total white cell count was subsequently found by Dr. L. J. M. Laurent to be 8320 per c.mm. The following examinations of the blood were also made by Dr. McCartney on March 29th.

Weil-Felix reaction with *proteus* X 19 "H" strain negative. Widal reaction negative to *B. typhosus*, *B. paratyphosus* A and B. Wassermann reaction ++.

Subsequent examination of the blood on April 1st and 7th for the Weil-Felix and Widal reactions yielded the same result, and the Wassermann reaction of the blood examined on April 7th was again ++. A culture of the blood taken on April 1st showed after 24 hours' incubation a growth consisting of a Gram-negative bacillus of the coliform type and a small Gram-positive cocco-bacillus of the diphtheroid type. Neither of these organisms were identified as belonging to any of the pathogenic groups and were therefore regarded as contaminants. The Wassermann reaction was performed for the third and last time on May 13th and was still found to be ++.

CASE TWO.

The patient's mother, a woman aged 36, was taken ill with somewhat similar symptoms on March 26th and

* These cases were mentioned in THE LANCET last April (1930, i., 834 and 936) under the heading of Infectious Disease in England and Wales.

[1] Proc. Roy. Soc. Med., 1930, xxiii., 1030; See also THE LANCET, 1930, i., 750.

[2] See THE LANCET, 1928, i., 1224.

was sent to the Western Hospital on April 3rd as a case of typhus.

On admission she presented a faint mottling of the chest and abdomen. There were signs of bronchitis. The patient was very deaf but was quite sensible. Temperature 103·4°, pulse 104, respirations 30.

The clinical and hæmatological picture in this woman was very similar to that of her daughter. The temperature at first kept high and then assumed an intermittent course before becoming normal on the thirty-fifth day of disease. Enlargement of the glands of the neck were first noticed on the nineteenth day of disease and a few days later the axillary and inguinal glands became enlarged. No enlargement of the spleen, however, was detected. In both the mother and daughter convalescence was rather slow, and it was not until May 21st that they were discharged on the fifty-eighth and sixty-first day of disease respectively. The enlargement of the glands in the axilla and groin had then subsided, but the cervical glands were still enlarged in both patients.

The following reports on the mother's blood were made by Dr. McCartney :—

"April 5th : Weil-Felix reaction negative. Widal reaction negative to *B. typhosus*, *B. paratyphosus* A, and *B. paratyphosus* B. Wassermann reaction negative. Blood cultures showed an organism with the characteristic features of *Streptococcus fæcalis*, which was regarded merely as a contaminant.

Differential count, April 17th : Polymorphs 33 per cent., large lymphocytes 62 per cent., small lymphocytes 2 per cent., large mononuclears 3 per cent. Eosinophils and mast cells nil. The polymorphs show signs of immaturity, in many of them the nucleus is not lobed but merely horse-shoe shaped. The red cells vary considerably in size, but there is no poikilocytosis. No nucleated red cells were seen. A few of the red cells showed punctate basophilia. No parasites were seen. The total cell count is not known, but the blood has the appearance of acute glandular fever (infective mononucleosis)."

The total leucocyte count was subsequently found by Dr. Laurent to be 7640 per c.mm. A second examination of the blood made on May 8th differed from the first in that the Wassermann reaction was positive, while the differential count (polymorphs 19 per cent., eosinophils 5 per cent., small lymphocytes 6 per cent., large lymphocytes 69 per cent., large mononuclears 1 per cent.) was remarkable for the high percentage of eosinophil cells.

COMMENT.

The resemblance to typhus in the two cases under consideration were the sudden onset, the high fever, the bronchitis, deafness, retention of urine in the younger patient, and the positive Wassermann reaction. On the other hand, the points against such a diagnosis before the appearance of the glandular enlargement were the indefinite character of the eruption, the negative diazo reaction, and the absence of any known source of infection.

Although there is no characteristic eruption in glandular fever, several writers such as Glanzmann,[3] Tidy,[4] and Evans and Robb [5] have recently drawn attention to the occurrence of rashes resembling scarlet fever, measles, rubella, or the rose spots of enteric fever, but we have not found any previous mention of an eruption in glandular fever resembling that of typhus.

The immunity from typhus which London has enjoyed for many years and the absence of any known exposure to infection seemed to be an even more important argument against the diagnosis of typhus. As J. D. R. had occasion to remark at the aforesaid discussion on tropical typhus[1] during the 30 years in which he had been in fever practice there had been only 71 cases of typhus, of which he had seen about a dozen, admitted to the Metropolitan Asylums Board hospitals, and the last case in which the diagnosis had been confirmed was in 1918.

After the woman's admission to hospital, the father and the only other child, a girl aged 9, was examined by M. R. in order if possible to trace the course of infection. Though he was in a bad state of health, having recently undergone malaria treatment for general paralysis, the father was not suffering from any acute illness, and examination of his blood by Dr. F. H. Teale gave the following results :—

Wassermann reaction completely positive. Weil-Felix reaction negative. Widal reaction : agglutination with *B. paratyphosus* B completely positive in dilutions 1 : 25, 1 : 50, 1 : 125, 1 : 250, 1 : 500. Culture : no growth of organisms. No organisms of the typhoid or paratyphoid group were isolated from the stools.

The child appeared to be in good health and gave negative Widal, Wassermann, and Weil-Felix reactions, but on April 12th we learnt that the younger patient's cousin had been admitted to St. Bartholomew's Hospital with symptoms resembling those of the supposed typhus cases, and on a visit to this hospital we found that she had been diagnosed as suffering from glandular fever. The positive Wassermann reaction which at first seemed to favour the diagnosis of typhus was afterwards thought to be connected with the paternal syphilis, but on inquiry it was found that the father had contracted his infection after the daughter's birth, and we have since been informed that several cases of glandular fever in which no other evidence of syphilis was obtained gave a positive Wassermann reaction. The late development of any obvious glandular enlargement is by no means unusual in glandular fever, as Glanzmann and Evans and Robb have recently shown, and as one of us (J. D. R.) had an opportunity of observing through the kindness of Dr. Cecil Wall in several cases at the London Hospital, as well as in another case sent to the Western Hospital as scarlet fever, in which the adenitis did not appear till the thirteenth day of disease.

[3] Glanzmann, E. : Das lymphaemoïde Drüsenfieber, Berlin, 1930.

[4] Tidy, H. L. : Brit. Med. Jour., 1930, i., 881.

[5] Evans, G., and Robb, W. A. : Brit. Med. Jour., 1930, i., 1039.

RETROBULBAR NEURITIS AND DISSEMINATED SCLEROSIS.

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It is well recognised, both by ophthalmologists and neurologists, that acute retrobulbar neuritis is a common symptom of disseminated sclerosis and may occur as the first manifestation of this disease. The literature upon the subject has been recently reviewed by Brain,[1] who concludes that "every case of retrobulbar neuritis for which no other cause can be found should be regarded as a possible case of disseminated sclerosis," and that "it must be borne in mind that the absence of further symptoms for many years does not exclude the possibility of the ultimate development of disseminated sclerosis."

The question of frequency of this symptom in disseminated sclerosis is one that has interested me for some time, and in view of the relative paucity of papers dealing particularly with this point it has seemed to me worth recording some personal observations. These are taken from a series of cases seen in private practice under conditions which permitted a careful examination of the history obtained from patient and relatives with particular

[1] Brain, W. Russell : Quart. Jour. Med., 1930, No. 91. p. 343.

reference to visual disturbance. This is a matter of some importance, for a story of retrobulbar neuritis in the past, often attributed at the time to some plausible infective or toxic cause and ending in recovery, is not likely to be connected in the patient's mind with a subsequent weakness or numbness of the limbs. Moreover, the memory of many patients with disseminated sclerosis is defective by reason of their disease. Unless, therefore, the point is carefully inquired for in every case the incidence is likely to appear lower than it really is.

In a series of 139 cases of disseminated sclerosis in which the clinical diagnosis appeared certain, a history of an attack of retrobulbar neuritis was obtained in 39, or 28 per cent.

Of equal interest is the proportion of cases in which retrobulbar neuritis is the *first* symptom of the disease. This has been estimated by American and French authorities, quoted by Brain, as something under 10 per cent. In the present series the onset of retrobulbar neuritis preceded all other symptoms in 20 cases and appeared together with other symptoms at the onset in another six. In two-thirds, therefore, of the cases in which retrobulbar neuritis occurred, it marked the onset of the illness, and of the total number of 139 cases under review retrobulbar neuritis occurring alone was the first symptom in roughly 15 per cent.

A further question of interest in relation to the ætiology of those cases of retrobulbar neuritis usually regarded by the ophthalmologist as of uncertain or obscure origin is the interval, when retrobulbar neuritis is the first symptom of disseminated sclerosis, before other signs of the disease appear. Of the 20 cases in this series, further symptoms developed in under 2 years from the onset of the retrobulbar neuritis in ten cases, in over 2 years but under 5 years in five cases, and in the other five cases the latent interval was over 5 years.

The following summaries from the notes of three of these cases illustrate the length to which this latent interval may extend :—

1. Mrs. A, aged 42, seen Jan. 1st, 1930. Three years ago partially lost power in the legs. At the same time use went out of left hand. Improved, but recently walking worse. Diplopia during past month. Admitted on questioning that in 1913 she quite suddenly lost the sight of one eye. This recovered in about three weeks. Then the other eye went blind, and recovered in a similar period. On examination pallor of both discs, nystagmus, intention tremor left upper limb, spastic weakness of lower limbs, with extensor plantar responses.

2. Miss B, aged 24, seen June 12th, 1929. One month ago an attack of vomiting and vertigo. During past few days numbness in right hand. Admitted on questioning an attack ten years previously at the age of 14 of dimness of vision in both eyes associated with severe headache. Was seen by an ophthalmic surgeon who diagnosed retrobulbar neuritis. On examination pallor both discs, nystagmus, loss of postural sense fingers of right hand, absent abdominal reflexes, right plantar response extensor.

3. Mr. C, aged 60, seen August 24th, 1927. Two years ago noticed difficulty in walking which has progressed. Eighteen years ago suddenly lost vision in right eye. Diagnosed retrobulbar neuritis. Saw many ophthalmic consultants with various opinions as to cause ; sight improved. Five years ago left eye similarly affected and improved. On examination primary optic atrophy with bilateral central scotoma, nystagmus, slight spastic weakness of left upper limb, and marked spasticity and weakness of both lower limbs, with extensor plantar responses. The Wassermann reaction in blood had been tested many times, and was found negative on all occasions.

It follows that in a case of retrobulbar neuritis of obscure origin disseminated sclerosis remains a possible cause, even if no further signs of this disease have developed after a period of 10 or 15 years.

MEDICAL SOCIETIES

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

AT a meeting of this Society on June 19th, with Dr. G. CARMICHAEL LOW, the President, in the chair, a paper on the

Pathology and Treatment of Sprue

was read by Dr. N. HAMILTON FAIRLEY. Having had the doubtful advantage of suffering from sprue for two years, he said, he had been able to assess the value of various forms of treatment on his own *corpus vile*. As regards causation, there was only one recent piece of positive evidence—namely, Mackie's isolation of a pleomorphic organism resembling *Bacillus mallei*—and none of the ætiological theories had in any way modified the treatment. Pathologically, the disease was essentially an atrophic degeneration of the digestive tract, with megaloblastic inflammation of the bone-marrow. The intestinal lesions, which were primarily inflammatory and secondarily atrophic, had a notoriously patchy distribution and, in the later stages, implicated the whole tract. At times, however, the main brunt of the attack might fall on the ileum, the jejunum, the stomach, or the tongue. Dr. Fairley suggested that derangement of the ileum specially underlay defective absorption of fat, vitamin D, and calcium, and that jejunal involvement, leading to an inevitable decrease in the secretion of succus entericus, prevented normal splitting of cane sugar, lactose, and maltose. Abnormal fermentation of the resulting disaccharide residue was largely responsible for abdominal distension and the acid, gaseous stools so characteristic of sprue, while their increased fat content contributed largely to their bulkiness. Involvement of the stomach was indicated by the frequency of defective acid secretion, and, as in pernicious anæmia, deranged gastric secretion probably underlay the megaloblastic hyperplasia of the marrow and the megalocytic anæmia so characteristic of sprue. No essential relationship, however, exists between megalocytic anæmia and achylia gastrica, for several of the present series showed anæmia of this type associated with a free secretion of HCl. Dr. Fairley thought that the aplasia of the megaloblastic marrow might result from malnutrition, being analogous to the corresponding changes produced in the normal megaloblastic marrow of pigeons undergoing starvation. It had been shown that total as well as the ionic serum calcium was often reduced in sprue, and that this reduction was unaccompanied by an increase in the inorganic phosphorus. Marked lowering of the serum cholesterol was a characteristic finding in the severer cases.

TREATMENT.

The essential principles in the treatment of sprue might be summarised as follows : (1) alimentary rest ; (2) restoration of the blood to a normal condition ; (3) reinforcing demonstrable deficiencies such as lowered blood calcium and defective HCl secretion.

The most rational method of obtaining alimentary rest was by administration of a high protein, low fat, low carbohydrate, and adequate vitamin diet. The effects of a high protein diet were very obvious clinically since the stools showed a fall in their fat content, became neutral or alkaline in reaction, and rapidly decreased in bulk and number, while abdominal distension and intestinal flatulence disappeared. During the first two or three weeks weight may be lost or little gained, but once the bowel has been adequately rested and the anæmia rectified, higher caloric diets were well tolerated. Where patients were specially emaciated or the weight-curve fails to show the customary rise, insulin in doses of 6 to 12 units daily might be employed with striking benefit.

In all cases of megalocytic anæmia Dr. Fairley had given liver extract in full dosage (=1¼ lb. daily). Steady improvement in the red cell counts and percentage of hæmoglobin had followed, and generally a reticulocyte response whose intensity was inversely proportional to the gravity of the anæmia. Anæmias not frankly megalocytic in type had also improved under this régime, but reticulocyte response was absent. It has not yet been ascertained to what extent purely dietetic measures were responsible. Where the total serum calcium was below 9·0 mg. per 100 c.cm., calcium lactate or calcium and sodium lactate were administered, and in special cases irradiated ergosterol (vitamin D) was also given. In addition, a low fat diet was always instituted. Restoration to a normal blood calcium level invariably followed treatment along these lines, and generally paralleled improvement in alimentation. HCl was supplied in adequate dosage to all cases where its secretion was proved defective.

After prolonged experience of tropical sprue, Dr. Fairley is convinced that clinical observation should always be reinforced by biochemical and hæmatological data whenever possible, and also that in a disease so notoriously liable to relapse every patient should from time to time report for medical examination. Nor should treatment cease with discharge from hospital. Over-fatigue, extremes of temperature, and cold and chill must be avoided; and for many months, or even years, the diet may need careful supervision, especially in regard to carbohydrate excess. In cases of achylia gastrica and achlorhydria continued administration of HCl and a maintenance daily dose of liver extract equal to ¼ lb. of the fresh organ is advised until such time as normal gastric secretion be restored.

DISCUSSION.

Colonel F. P. MACKIE agreed with Dr. Fairley in his main points. He had been associated with him in researches on sprue for so many years that much of the work that led up to this paper had been done conjointly.

Dr. P. MANSON-BAHR, as a result of a study of 200 cases of sprue treated during a survey of seven years' work at the Hospital for Tropical Diseases, was able to show graphs which illustrated from strictly clinical observation the bases of many of the principles Dr. Fairley had laid down. The increase in body-weight corresponded in a remarkable way with the decrease in the amount of stool passed, and the curve in improved nutrition runs parallel with the improvement in the blood as graphed in results of red cell counts and hæmoglobin values. His results, which were being published in the near future, indicated that sprue was a specific inflammation of the gastro-intestine, with a definite incubation period, but that the virus was capable of lying latent in the human body for a very considerable period—a period of sometimes 8–25 years. His indications for treatment were the same as Dr. Fairley's, and were based upon the principle of complete alimentary rest until such time as absorption through the small intestine had increased combined with renewed secretion of the succus entericus. His treatment consisted of partly milk and partly high protein dietary, with the exclusion, as far as possible, of a high fat and carbohydrate content. His experience, looking back over ten years, had been fairly satisfactory.

Dr. G. M. HARSTON referred to the favourable effects of heliotherapy in sprue which he had seen in Hong-Kong, and which corroborated the experience of Dr. Manson-Bahr and Dr. Fairley at the Hospital for Tropical Diseases.

Dr. G. W. GOODHART suggested that there was a great difference between the nutrition of the skin in sprue and in pernicious anænia. Another essential difference was the almost immediate and striking increase in body-weight in pernicious anæmia on a protein dietary, whereas a similar rapid increase did not occur in sprue on a high protein non-residue diet.

The PRESIDENT, on the strength of 30 years' experience of treating sprue, made critical comments on the lasting value of the various forms of treatment advocated during that period.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OTOLOGY.

THE summer meeting of this Section was held at Nottingham on June 27th and 28th, with Mr. W. M. MOLLISON, the President, in the chair.

A paper on disturbances of hearing in

The Adenoid Child

was read by Prof. GUIDO GUIDA, who said that at the first sign of deafness in a child specialist advice should be secured, for at this early stage it would usually be possible to avoid lasting disability. In various provinces of Italy a Government inquiry showed that from 10 to 50 per cent. of the children with adenoids had defective hearing. There were also cases in which adenoids were associated with a subnormal mentality. The Italian Government had instructed provincial authorities to organise special agencies against "adenoidism," and these were supposed to coöperate with existing hospitals and clinics. Cases detected in schools were sent to the proper place. Prophylaxis was first carried out for some days in the form of inhalations of calcium or iodine. It was very neessary that frequent examinations of the patient's hearing should also be made.

The PRESIDENT said the profession in this country did not claim to have yet discovered the reason why children had enlarged tonsils and adenoids. He would like to know more about the effects of the prophylactic use of calcium and iodine.

Mr. SYDNEY SCOTT was glad that the Italian Government insisted that these operations should be done only by specialists. Too often in the less populous parts of this country medical men with little or no special qualification for the work had been appointed to clinics.

Mr. H. BELL TAWSE alluded to the investigation made during the last five or six years by a committee of the Board of Education. So far most of the inquiry had concerned children of school age, and had yielded little positive result. It was clearly necessary to go back to the years before school age. In the next few years that committee would issue a further report. An 18 months' trial of bicarbonate of soda for a time before the operation—grs. 10—had resulted in much less post-operative bleeding than formerly.

Mr. L. GRAHAM BROWN said that before the war children were usually brought for operation at 14 to 16 years of age, whereas now the majority brought were between the ages of 4 and 6. This, he thought, showed that the authorities were becoming increasingly appreciative of the close relation between adenoids and deafness. It was very important nationally that adenoids should be recognised and treated early. However young the child, if symptoms pointed to the need, the operation should be carried out. He had noticed that many children sent back for a repetition of the adenoid operation had nothing more than nasal catarrh; medical officers hastily assumed that the condition was adenoids without adequate examination. Some of these children had maxillary sinus suppuration.

Mr. HAMBLEN THOMAS said the London County Council were endeavouring to ascertain the cause of adenoids. Attempts had been made to continue the examination of the children over a period of five years, but towards the end of that time so many failed to appear that convincing statistics could not be compiled. The dietetic factor was important. Children should be examined before school age, for often the damage had been done by the fifth year.

Dr. A. LOWNDES YATES pointed out that it was not until the fifth year that the permanent teeth passed into their adult position, the antrum was enlarged, the ethmoids began to increase, and the middle turbinal came into the nasal airway. Adenoids should not be removed at a very early age, for they had a definite function in removing dust and micro-organisms before the more adult mechanism was fully established. He had noted that when children were exposed to a highly infective environment—as when the mother had much pyorrhœa or ozæna—they formed adenoids early. But if the mother's infective condition was cleared up, the child's adenoids also got well. Excess of lymphoid tissue in these children thus seemed to be a result of sepsis, doubtless coupled with wrong food and other errors. Investigation along these lines would probably be fruitful.

Mr. W. S. THACKER NEVILLE remarked on the lack of provision in this country for the mass examination of school-children for deafness.

Mr. HUGH E. JONES said that many children were sent by school authorities for operation for tonsils and adenoids who did not need it. In most cases the reason was that the children were not examined by experts, nor even by medical people, but merely by a mistress or assistant master. Examination of school-children should be carried out by competent people. He advocated for use on children a much smaller guillotine than was usually employed. Children of 1½ to 2 years should not be subjected to the adenoid operation unless there was obvious interference with breathing.

Mr. T. B. LAYTON agreed with Dr. Lowndes Yates in looking upon adenoid tissue as a physiological structure to be conserved in early life. Adenoids, he thought, were pathological only when they obstructed either the posterior nares or the Eustachian tube, or both. He was carrying out two kinds of operation, according to whether the indication was nasal or aural. If the latter, he removed the lymphoid tissue round the Eustachian tube, leaving the tissue in the mid-line. The child living under bad conditions needed all its lymphoid tissue to combat infection; hence those living in dense slums should not be subjected to the operation. He inquired of parents how many rooms they occupied, and if overcrowding was indicated he did not operate; and so far he had seen no reason to regret that policy.

Mr. HAROLD KISCH said that he had been for a time in contact with a European colony in India, living at an altitude of 5000 feet, and though the children were well looked after, and had enough good food with milk, they had enormous tonsils and adenoids. He operated on all of them. He was sure tonsils were sometimes a definite focus of infection; on at least two occasions he had removed a pad of adenoids with an abscess inside, and he had seen glandular masses elsewhere disappear after adenoids had been removed. When adenoid operations had been done for deafness, the children should be kept under observation, and inflation should be done.

Mr. C. A. RIDOUT said that in many cases of supposed sinus infection after recurrent adenoids the condition was nothing more than nasal sepsis. That was another reason why these operations should be done by competent laryngologists, otherwise many cases of sinusitis would be missed. In some cases the trouble would disappear spontaneously with the development of the sinuses.

Mr. F. W. WATKYN-THOMAS said that in a number of cases of so-called recurrent adenoids there could be seen a felted mass of mucosa extending from one pillar to the other, the whole condition being obviously associated with nasal sepsis.

Prof. GUIDA, in reply, said it was the custom in Italy to test the hearing of school-children, and sometimes before operation they were sent to have inhalations of 5 per cent. chlorine and chloride of calcium. Iodine was also used in the form of iodine-charged waters, or many children seated in a room could inhale iodine-charged vapour from a kettle. Ten per cent. were cured of their deafness by the adenoid operation. Children were not operated upon in Italy younger than 3. The hearing tests were carried out separately on each child, not en masse.

Dr. A. LOWNDES YATES read a paper on

Repair in the Middle Ear.

Five years ago, he said, when he was interested in the repair of nasal and of aural epithelia he found that in certain cases although repair of the epithelium took place apparently the hearing did not become normal. He therefore carried out experiments to ascertain the relation between the healing process and the restoration of the middle-ear function. Working on a model of the middle ear, in which a microphone connected with a loud speaker was fitted in place of the cochlea, he found that in the artificial middle ear there were three primary positions of the ossicles: (1) a position of rest, in which only penetrating or loud sounds were heard; (2) a position of listening, in which the ossicles lay in a position in which there was maximal hearing of all notes; (3) a position in which the membrane was indrawn, similar to that at the summit of a wave of sound when it fell on the membrane. This last position he characterised as that of "having heard." Thus deafness might result either from maintaining the position of rest or that of "having heard."

If the membrane was indrawn it was the custom to inflate the ear, but in most cases this was not good practice, because the infective products which blocked the tube and caused the vacuum might be blown into the cavity of the middle ear and there cause inflammation. A better plan was to aspirate the mucus from the interior of the Eustachian tube by the catheter designed by Weber and Liel. Cerumen was secreted in a very fluid form and ran over the tympanic membrane, thus oiling it and preventing the evaporation which perhaps occurred from the mucus present in the middle ear. It seemed clear that evaporation could occur through the tympanic membrane, and in mild conditions of inflammation repair might thus be hindered. In subacute otitis media the membrane was sometimes pushed out by mucus lying between it and the inner tympanic wall. This mucus was removed at intervals by the action of the cilia. In these cases there was pain and, later, a partial deafness which increased in degree, and the alterations in hearing were similar to those by which otosclerosis was diagnosed.

If the view was accepted that listening was, in part, the result of the contraction of the tensor tympani which brought the cog processes of the malleus and the incus into contact, then repair within the middle ear might be complete, but leave the structures in a position which made listening difficult. In many of the cases which showed a high degree of auditory fatigue there was evidence of a lesion of the perceptive mechanism. In some in which such was not the case it was found that the patients had no power of resting their ears, and the mechanism of the middle ear was retained in the position of listening.

Dr. Yates described his experiments on the character and action of mucus, and said that repair within the middle ear seemed to depend on the interplay of two mechanisms: that concerned with the removal of the mucus by the cilated epithelium, and that concerned with destruction of the agents causing infection. When mucus contained leucocytes and such organisms as the *Staphylococcus aureus*, desquamation was not great, and the ciliated epithelium began to act again quickly after the inflammation subsided. When, however, the cells visible in the mucus represented desquamated epithelium, repair was much slower. The proteolytic ferments elaborated by the micro-organisms were the most important element in the prevention of repair in the leucocytic type of inflammation; it was, indeed, these ferments which caused the perforation of the membrane.

Otosclerosis was a condition of the labyrinthine capsule, and so was a state which could not be recognised until the ear was examined post mortem. Otology would be much helped if the term "otosclerosis" were dropped and research were centred round the desquamative types of inflammation, which produced symptoms indistinguishable from those said to be present as a result of the lesions of the labyrinthine capsule. His treatment of these cases had been successful only in the early stages; it was to carry out repeated aspiration of the Eustachian tube, combined, where necessary, with myringotomy. If the membrane was pushed out in minor states of inflammation, a type of deafness resulted which had been described as an inability to listen. If this was present during the active stage of inflammation, myringotomy would relieve the tension, and the need for this must be diagnosed by the results of the hearing tests. In every state of inflammation of the middle ear the repair might be prevented by conditions which affect the general health.

The speaker submitted the following conclusions:—

(1) When repair occurs within the middle ear it does so because of the activity of the bactericidal action of the mucus and of the cilia which move the mucus on. The state of repair of this region can be assessed to some extent by the discharges which lie within the tube or which escape through the perforation in the tympanic membrane. It is important to recognise the two main types of inflammation in the ear—the eucocytic and the serous—and to try to treat each in the appropriate way.

(2) Most of the lesions causing deafness arise as a result of inflammation in the middle ear; and the two primary positions in which the normal ear hear with diminished acuity are that of "having heard" and the position of "rest." The two common forms of deafness may be due to the auditory mechanism becoming fixed in these positions, while fixation may occur in the position of listening which make it impossible to rest the ear.

A discussion followed.

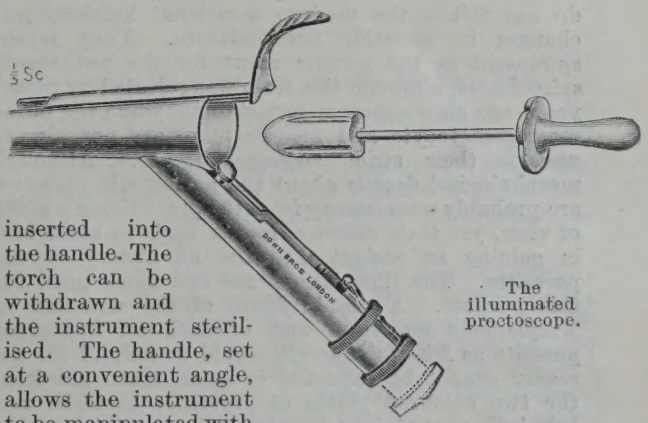
OTHER COMMUNICATIONS.

The meeting then considered the preliminary report of the committee appointed by the Section to inquire into hearing tests.—Dr. H. MUIR EVANS read a paper, supported by numerous slides and some specimens, on the Swim Bladders of Fishes and Weberian Ossicles, and Dr. YATES gave a demonstration of sound records, explaining the principles of the talkie machine.—On Saturday a series of clinical cases were shown, and the remaining items consisted largely of demonstrations, among them one on the galvanic method of testing the auditory apparatus.—Mr. G. WILKINSON spoke on some mechanical problems in the construction of cochlear models.

NEW INVENTIONS

AN ILLUMINATED PROCTOSCOPE.

THE proctoscope here illustrated has been designed specially to meet the requirements in the modern treatment of hæmorrhoids by injections. The illumination is obtained by a standard pocket torch inserted into the handle. The torch can be withdrawn and the instrument sterilised. The handle, set at a convenient angle, allows the instrument to be manipulated with ease. The conical shape gives ample room for injections to be made whilst the mucous membrane remains under observation. As a rule injections are made with the slide in position. The instrument can then be rotated without reinserting the obturator. The site of the injection can be accurately determined by withdrawing the lateral slide. The instrument is equally useful in routine rectal examinations and in minor rectal surgery. For use in operative work a similar instrument on a slightly larger scale is more useful.



The illuminated proctoscope.

This proctoscope has been made by Messrs. Down Bros., Ltd., St. Thomas's-street, London, S.E.

PETER G. MCEVEDY, F.R.C.S. Eng.

REVIEWS AND NOTICES OF BOOKS

Tropical Medicine.

By Sir LEONARD ROGERS, C.I.E., M.D., F.R.S., Major-General, I.M.S. (Ret.), Medical Adviser to the India Office; and JOHN W. D. MEGAW, C.I.E., M.B., Director-General, I.M.S. Churchill's Empire Series. London: J. and A. Churchill. 1930. Pp. 536. 14*s*.

THE joint authors of this book have contributed in great measure to the advancement of tropical medicine. Many years' experience in clinical and pathological teaching work in India has convinced them of the need for a small book which describes such simple microscopical work as the practitioner in the tropics can carry out himself. The existing works on tropical medicine, they consider, meet the detailed demands of readers anxious to qualify for a diploma rather than those of the practising doctor.

The conception and also the arrangement of the subject matter is novel. Tropical diseases are classified into ten sections, of which the more important are headed: febrile diseases caused by protozoa, febrile diseases caused by spirochætes, febrile diseases of uncertain origin, the typhus fever group, bacterial febrile diseases, bowel diseases with symptoms of diarrhœa and dysentery, diseases associated with diet and those caused by heat and light. This clinical classification is straightforward and easy to follow. Much space is devoted to the history of tropical medicine, and here the teaching differs in some details from that usually given. Some chapters, as Chapter IX. on the typhus group and Chapter XXIV. on climate as a disease factor, deserve especial praise. In the matter of terminology we note that the authors do not follow the modern somewhat kaleidoscopic changes in scientific nomenclature. They retain *spironema* as the generic name for the pathogenic spirochætes, although this term was rejected by Styles years ago on account of fore-stalling, while the terms macrogametocyte and macrogamete are not always used in their strict zoological sense. Although morphological details about the pathogenic parasites are probably unnecessary from the practitioner's point of view, yet their absence leaves little to assist him in gaining an insight into the life-history of the parasites. The illustrations are not much good for this purpose. A simple figure of the structure of *Ancylostoma duodenale* and of such an important parasite as *Filaria bancrofti* would be helpful, for the reader cannot be expected to glean much aid from the two coloured plates of protozoa, bacteria, and helminth eggs stained in various ways, which are so reduced in size as to become difficult to decipher. The same criticism may be levelled at the black and white figures giving in brief the story of a disease. The sections on treatment are satisfactory on the whole, though some of the statements are rather too dogmatic. The authors show but little enthusiasm for certain drugs which have received wide support. For example, plasmoquine in malaria, and Bayer 205 in trypanosomiasis, and yatren in amœbiasis. There is surely no justification for stating that *Filaria bancrofti* has a "diurnal periodicity" (p. 385), or that the Planorbis snail is furnished with an operculum (p. 413). The book is in the main accurate and is full of good material.

The Adolescent: His Conflicts and Escapes.

By SIDNEY I. SCHWAB, M.D., Professor of Neurology; and BORDEN S. VEEDER, M.D., Professor of Physical Pediatrics, Washington University. London: D. Appleton and Co. Pp. 365. 10*s*. 6*d*.

THE sudden burden that is placed upon the adolescent at puberty has both physical and its mental components. The fructifying of the sexual life has its repercussion upon both body and mind, and it is the ability of the human being to bridge this perilous gap that marks future failure or success in life. Although modern psychology rightly stresses the first five years of life as formative of character, the period of puberty is certainly second in importance. The authors have introduced their subject very naturally by reference to the physical growth and development of the adolescent, but they realise that the psychological mechanisms involved in the process of maturing and of adjusting social life are of paramount importance. They therefore analyse in great detail every aspect in the life of young persons of both sexes at this turning point. They tend to take an environmental view of the conflicts and adjustments, normal and abnormal, which characterise the life of the adolescent. Sex, too, is rather cleverly treated as an environmental factor and not as an internal urge alone. This is a very important point of view, because there is no doubt that the sexuality of young persons is largely coloured by the milieu in which they find themselves. But, on the other hand, while the Freudian theories are discussed, the authors do not give Freud all the credit for having explained the deep significance of some of the conflicts of puberty which can only be superficially understood in terms of immediate problems. Any student of dementia præcox knows that the stress which is alleged to have precipitated the pathological introversion is usually quite inadequate to explain the depths to which the cleavage in the mind usually goes. The result is that in the authors' discussion of personality problems their treatment of this nuclear problem in psychopathology appears too superficial. For those, however, who require a guide to the understanding of the immediate problems of adolescence this book can be cordially recommended.

Roentgenographic Technique.

By DARMON ARTELLE RHINEHART, A.M., M.D., Professor of Roentgenology and Applied Anatomy, School of Medicine, University of Arkansas; Roentgenologist to St. Vincent's Infirmary. London: Henry Kimpton. 1930. With 159 illustrations. Pp. 388. 28*s*.

BELIEVING that all books on radiographic technique "are either obsolete or incomplete in some particular," Prof. Rhinehart set to work to write a new manual for physicians, students, and technicians, which should be free from such defects. He has certainly produced a fine and original work. He criticises the usual presentation of radiographic technique for making no provision for differences in the apparatus or equipment at disposal; moreover, it is usually based on a hypothetical patient of certain dimensions. By introducing a series of experiments to determine the operating peculiarities of each machine, by pro-

viding a simple experimental method of gauging the effective output of each equipment, and by basing exposures on the thickness and radiographic density of the parts of the body, he claims to produce a standardising technique, irrespective of the diverse conditions that are met with. In the experiments described, the reader is instructed how to build up charts and graphs suited to his own conditions of work—e.g., a thickness-voltage chart, and considerable use is made of teeth embedded in paraffin blocks to determine the necessary voltage to produce a radiogram of satisfactory quality through various thicknesses, corresponding, of course, to different parts of the body. Everything is worked out so that standardisation can be obtained with such apparatus as is available.

The first half of the book deals with the physical and technical side of radiology, leads up through experiments to "a basic roentgenographic technique," and includes very useful miscellaneous instruction. The second half gives the applied technique for different parts of the body. The final chapters on the urinary tract and on localisation are hardly up to the standard of the rest of the book. When giving instructions on localisation the author might have quoted more fully from the excellent American Army X Ray Manual to which he refers. In the section on the gall-bladder, Prof. Rhinehart strongly advocates the oral administration of the dye. He says: "We have examined several hundred patients by means of cholecystography. A short and stormy experience with the intravenous method prompted its complete abandonment in favor of the oral administration." It is permissible to wonder what tragic story lies behind this statement, for in most centres the oral method had an uphill fight to obtain recognition, and the advocates of the intravenous method held the field for years, in spite of the obvious disadvantages of a minor operation.

The chief value of the book is that it records the practical personal experience and judgment of one who has made himself master of his subject. It will surely be of great value to all students and practitioners of radiology.

Lehrbuch der klinischen Untersuchungsmethoden für Studierende und praktische Ärzte.

Seventh edition. Von Prof. H. SAHLI. Vol. II. First part. Leipzig and Vienna: Franz Deuticke. 1930. Pp. 368. M.22.

THE present edition of Prof. Sahli's well-known handbook has numerous additions. The new methods introduced are confined to those which have a real value in clinical medicine. The multiplication of biochemical and other methods of investigation in recent years has been excessive, and we welcome the stand that Prof. Sahli has taken in discountenancing technical procedures that inflict discomfort or even danger to the patient out of all proportion to the value of the results produced. The abundance of alternative methods may so encumber medical diagnosis that essential points may be overlooked. The choice from such alternatives must be a matter of scientific knowledge and not of intuition, which, as Prof. Sahli remarks, is based upon hard work and observation, and is not an "art" inherent in some and lacking in others. Of those methods which he regards as really helpful and advantageous to a patient he gives a full and practical account. This volume deals with methods of examination of the urine, sputum, and blood, and provides detailed descriptions of technique as well as critical considerations of the results obtained.

New matter includes tests of renal and liver function, vital staining of the red cells, and discussions on the leukæmias and on gout. Throughout the work there is an emphasis upon fundamentals for which all Prof. Sahli's work is famous.

Minor Surgery.

Second edition. By ARTHUR E. HERTZLER, M.D., Chief Surgeon, Halstead Hospital; and VICTOR E. CHESKY, M.D., Chief Resident Surgeon to the Hospital. London: Henry Kimpton. 1930. Pp. 602. 42*s*.

THE avowed object of this book is to help what is termed the "dispensary student" to understand what he sees in the out-patient clinic. With this object in view discussions on pathology are omitted, and treatment is mostly referred to only in general terms, detailed technique being given where the authors have a particular method of their own. In so far as the book is magnificently illustrated, while typical lesions are clearly reproduced, it admirably fulfils its object. The authors' clinical material must be extensive and it has been utilised to fullest advantage. We have all sat as students in out-patient departments waiting to see and examine "lumps," and everything that could come into that category is here illustrated and described. If the student working in the out-patient department wants to read about a lesion in all its aspects he will be disappointed in this book, where he will find merely a brief account of the condition as it is seen clinically, and a scanty outline of its treatment and prognosis. But if he seeks description and illustration of the early picture of any disease of which he has seen an advanced stage he may find here exactly what he wants.

Slit-lamp Microscopy of the Living Eye.

Second edition. By Dr. F. ED. KOBY (Basle). Translated by CHARLES GOULDEN, O.B.E., F.R.C.S., Surgeon to the Royal Ophthalmic (Moorfields) Hospital; and CLARA LOMAS HARRIS, M.B. London: J. and A. Churchill. 1930. With 104 illustrations. Pp. 360. 15*s*.

ON its introduction the slit-lamp was regarded by many ophthalmic surgeons as little better than a toy, as far as its practical applications are concerned. Further experience tends to refute this opinion, and it must now be admitted that ability to use and interpret the slit-lamp is essential to the complete training of the ophthalmic surgeon of the future. This means that the student must devote some time to acquiring familiarity with the technique, and for this he will need an efficient teacher and a good book. In the periodical courses of instruction that are given at Moorfields Hospital this translation of Prof. Koby's book is used as a text-book. Koby's expressions are sometimes unnecessarily mathematical. For example, the convenient name given by Harrison Butler to the portion of the cornea illuminated by the narrow slit is "corneal prism," though it is admittedly not a prism in the ordinary sense. Koby calls it a "parallelopiped." It is, of course, only the anterior parts of the globe that are accessible to examination by the corneal microscope. With the

aid of the illumination provided by the slit-lamp it is now possible to detect minutiæ in either the normal or the pathological structure of the cornea, anterior chamber, iris, lens, and anterior part of the vitreous. The chief practical applications, that have so far been made, relate to corneal opacities, their depth and nature, the structure of the lens and the various varieties of cataract, changes in the structure of the iris, and the detection of particles in the aqueous humour, and of slight degrees of precipitation in Descemet's membrane. The most definite result to date of slit-lamp illumination is the discovery of various zones of discontinuity in the substance of the lens which have led to an entirely new nomenclature describing its structure, these being now distinguished from within outwards as embryonic nucleus, fœtal nucleus, adult nucleus, and cortex.

Diseases of the Blood.

By PAUL W. CLOUGH, M.D., Associate in Clinical Medicine, Johns Hopkins University. London: A. and C. Black, Ltd. 1930. Pp. 310. 6s.

In the exposition of any given subject there are those whose aim appears to be to render the simple as complex as possible; there are others who have the gift of rendering the relatively complex simple. The study of hæmatology has always attracted an unfortunately large proportion of the former class. Dr. Clough has the gift of clear exposition and knows how to avoid unessentials; what is more, he has the rare power of mastering and of applying general principles. This little work of only just over 300 pages contains more useful and well-arranged material than many more pretentious volumes of three times its size and six times its cost. On his first page the author takes care to point out that there is no such thing as a "disease of the blood;" he then sets forth concisely all that is known about the conditions usually considered under that head. Throughout the information is up to date and accurate. The book is not overloaded with illustrations, but such plates as are provided are excellent. It is refreshing to read a book on the blood in which it is neither assumed nor stated that 5,000,000 per c.mm. constitutes a divinely ordained normal for the red cells; in which it is made clear that there is no consensus of opinion as to what constitutes 100 per cent. of hæmoglobin; that the volume index is of even greater importance than the colour-index in the diagnosis of pernicious anæmia; and that nothing is to be gained by attempting to differentiate beween "large" and "small" lymphocytes or between monocytes and "transitional" cells. This will be a good book for students when examiners are educated up to its standard.

La rachianesthésie: sa valeur et sa place actuelle dans la pratique.

By E. FORQUE and A. BASSET. Paris: Masson et Cie. 1930. Pp. 222. Fr.30.

Prof. Forque and Prof. Basset have produced a comprehensive and judicial account of spinal analgesia. Unfortunately, the most recent developments in this line, spinocain "controllable anæsthesia" and percain, are not mentioned; probably neither of them had been made known while the book was being written. A large part of the work is devoted to physiological considerations, for the authors maintain that it is only on our full knowledge and understanding of the physiology of the cerebro-spinal fluid and of the spinal nerves that proper practice can be founded. They attribute the wide variations in technique to the fact that there is no clearly laid down and generally accepted account of the physiological problems involved. This account they declare themselves anxious to provide, and they certainly go far towards achieving this aim. Their views and practice are, generally speaking, strictly orthodox. They do not approve of high anæsthesia, reducing the use of spinal anæsthetics generally to operations below the umbilicus. They disapprove of barbotage, and they recommend fine needles and slow injection. They depend on amount injected and force of injection for the degree of anæsthesia to be obtained. The interesting and novel suggestion is made that perhaps in the last analysis the phenomena of spinal analgesia will all be explained on an electrical basis. The vomiting, which is not uncommon some 20 minutes after injection, these authors attribute to action of the injected drug on the vomiting centre, an opinion contrary to that generally advanced in this country. Their routine drug is novocain, which they use generally in an 8 per cent. solution, and inject preferably in the fourth lumbar space. The book is written with lucidity, and any anæsthetist should read it with pleasure and advantage.

REPORTS AND ANALYSES

SOYOLK.

(THE SOYA FLOUR MANUFACTURING CO., LTD., 7, MINCING-LANE, LONDON.)

"SOYOLK" is a pale yellow, very finely ground flour, prepared from the Soya bean by the Berczeller process (Eng. Pat. 234,202 of 1924), the beans being first heated in a dry state, then agitated and subjected to the action of low pressure steam. This amounts to a partial cooking process, and the resulting flour, whilst retaining the high nutritive value of the original beans, loses the characteristic rather harsh raw flavour.

When analysed the following results were obtained:

Moisture	7·3	per cent.
Fat	20·0	,,
Protein	43·5	,,
Mineral salts	4·7	,,
Phosphoric acid	1·44	,,
Lecithin phosphoric acid	0·16	,,
Fibre	1·38	,,
Cane sugar	10·50	,,
Other carbohydrates	10·10	,,

The nutritive value of "Soyolk" is very high, the conventional calorie value being 449 per 100 g., whilst that of a wheat flour is 360; nearly nine-tenths of the protein in "Soyolk" is soluble in pepsin hydrochloric acid.

The Soya bean is a well-known food material in the far East, and its introduction to the Western hemisphere is a useful addition to our food-supply. Hitherto the principal objection has been the rather unpleasant flavour, but this appears to have been eliminated in "Soyolk." It is interesting to note that some authorities claim that the protein in the Soya bean is one of the few vegetable proteins which, to a great extent, are capable of substituting meat proteins.

THE LANCET.

LONDON: SATURDAY, JULY 5, 1930.

DISINFECTION.

THE first volume of the Medical Research Council's "System of Bacteriology" is of more general interest than the four highly technical instalments which have actually been published before it. Prof. W. BULLOCH deals with the history of bacteriology with his usual accomplished mastery of the literature. Prof. F. W. ANDREWES, discusses the classification of bacteria and the criteria which give valid distinctions between genera and species, and Dr. J. A. ARKWRIGHT writes an extraordinarily interesting account of bacterial variation. Both these articles have wide biological implications, and we hope they will be read by many scientific workers who have no immediate connexion with microbiology. The same is true of the article by Miss HARRIETTE CHICK, D.Sc., on the theory of disinfection, which not only indicates how practical people may use disinfectants to the best advantage, but opens up the great problem of how animals are killed by harmful conditions of the environment, in other words, the principles of mass destruction through which natural selection operates. We wonder whether these products of the bacteriological laboratory are as familiar to general biologists as they ought to be. Miss CHICK points out that, when a disinfectant is applied to a large population of bacteria, the microbes are not all killed at once. The killing process takes time, even if that time is very short, and if the disinfectant is strong enough to kill the great majority in a minute or two it will hardly succeed in killing all of them in half an hour. If the killing time is reduced by increasing the strength of the disinfectant, or by raising the temperature at which it acts, the same relation holds; some microbes still survive much longer than the majority. Incidentally, we suspect that the influence of high temperatures in increasing the efficacy of disinfectants is hardly sufficiently realised except perhaps by those who insist on having hot water to wash their hands with; the killing effect of carbolic acid is enhanced about ten times by a rise of 10° C., and soap, at the hottest temperature which the average hand can bear (a little below 50° C.), is probably three or four times as fatal to micro-organisms as it is at body temperature. The killing being in all cases a time process, it cannot be as correct as it is convenient to talk of this or that organism having a certain "thermal death point"; all that is really ascertained is that at a given temperature, &c., a certain proportion—e.g., 90 per cent.—of the individuals are dead at the end of a certain time.

So much for the immediate practical applications. The more detailed analysis of this time process takes us into the fundamentals of life. It is found (and Miss CHICK herself has been mainly responsible for the discovery) that the individuals in a uniform population of bacteria die logarithmically, which is to say that if 50 per cent. die in the first minute of disinfection, 25 per cent. will die in the second minute, 12½ per cent. in the third minute, and so on; the number which die in any interval of time is always a constant proportion of those alive at the beginning of the interval. The extraordinary thing is that this is just the way in which molecules of cane sugar break up when they are boiled with hydrochloric acid, with the implication that the whole of the microbe is analogous to a molecule. Prof. A. E. BOYCOTT commented some time ago on the significance of this analogy in our conception of the units of which the world is made. It may be—the suggestion was made too recently to be incorporated in the article—that the death of the organism is determined by the destruction of some one particular molecule. This would, perhaps, make the analogy easier to accept, but it would leave the explanation of the facts where it is, since physical chemists can "explain" the behaviour of the cane sugar molecules only by assuming that they are subject to rhythmical changes in susceptibility to hydrochloric acid. This logarithmic process of death is also flatly discordant with the general rule that all measurable qualities of live organisms are distributed on something like the normal curve of variation. If resistance to disinfectants varies on the same plan as human stature or the diameters of blood corpuscles, there should be a few very susceptible organisms and a few exceptionally resistant, with the majority in intermediate positions. Killing off a population like this does not give a logarithmic curve, but one in which the rate of disinfection increases as the process proceeds. And it is necessary to note that though the logarithmic result has been obtained in a majority of the most careful observations, a result compatible with the normal curve of resistance has been reached several times. The logarithmic death-rate is, therefore, not an invariable rule, and Dr. HENDERSON SMITH has published figures which indicate that the mode may vary with the strength of the disinfectant.

The matter is puzzling enough, and Prof. C. EIJKMAN made it more curious when he discovered that bacterial spores germinate in the same logarithmic fashion. But there is no doubt about the fundamental importance of the problem, and the more people puzzle about it the better. They cannot do better than start with Miss CHICK's summary account.

THE I.M.S. AND THE SIMON REPORT.

IT is chiefly through the medium of the Indian Medical Service, which still contains a large British element, that this country has come into touch with medical affairs in India, and the future of that service is a matter of concern not only to those who are serving and those who contemplate

entering the service, but to all who are following the progress of medicine in the East. Doubtful or undesirable conditions of service would lead to an increase in early retirement, and to an accentuation of the shortage in recruiting which is already pronounced enough to give cause for anxiety. The proposals contained in the report of the Indian Statutory Commission are, as has been emphasised by Sir JOHN SIMON, merely recommendations; but even should they not be adopted, they cannot fail to influence future developments, for good or for ill. The most explicit reference in the report to the Indian Medical Service deals with the provision of European medical officers for the medical treatment of European members of the services in general and their families. This consideration has been repeatedly stressed by previous commissions, and the present report insists that no efforts should be spared to secure an adequate number of suitable recruits for the purpose. In other directions there have been many proposals during the last 40 years for the reorganisation of the Indian Medical Service; some of them have contemplated a separation of the civil branch of the service from the military, others a decentralisation of the civil side and the substitution of provincial services. Logically there was much to be said for several of these schemes, but the fact remains that all of them have so far been rejected on account of obstacles, insignificant enough in appearance, but apparently insuperable.

The crux of the problem at the moment, and the consideration which is most likely to affect recruiting, is the question whether the remaining civil appointments are to be dealt with on a central basis, in association with the military branch, or whether they are to be provincialised. On this the report sheds some light, if only indirectly. The Commission recommends that the Secretary of State should still retain power to prescribe the number of I.M.S. officers to be employed in the provinces, as well as the appointments and conditions upon which they shall be employed. This would seem to imply continuance on an all-India footing; and indeed many of the contentions in favour of all-India recruitment for the so-called security services, which include the civil service and the police, as well as for irrigation and forestry, would equally apply to medicine. It is argued with justice that an imperial service appeals to a large circle of candidates, while the status and tradition attaching to it draws recruits of a superior class. The recommendation of the Lee Commission that medical officers recruited on an all-India basis should continue to be employed in the provinces to maintain a war reserve is also cited, apparently with approval; it is pointed out that if European recruitment for irrigation, for example, were conducted on provincial lines, it would probably be on short-time contracts, involving risk, from an administrative point of view, that would be hard to justify. Precisely the same would apply to the I.M.S. It has been suggested that provincial ministers might be hampered in carrying out their duties by the limitations upon their control over members of the all-India services. In practice this has not been so. Evidence was given by these ministers before the Lee Commission that, with negligible exceptions, all-India officers serving under them had given their loyal support. No doubt the converse for the most part holds good, although there is an unfortunate impression in certain provinces that ministers in transferred departments (of which medicine is one) are apt to interfere unduly in detail. This tendency would certainly not be diminished by provincialisation.

If the right kind of recruit is to be attracted to medical service in India it is at the present juncture more than ever necessary to avoid any action which would tend to neutralise the improvements in the terms of service which have been lately introduced. Among other things these include, as our readers are aware, passage concessions, overseas pay, and reservation of certain posts. As regards existing members of all-India services, including the medical, the Commission appears to have done all that was in their power to safeguard their position. No change is to be made to their disadvantage, and they are to be entitled to any concessions that may be granted in future. A proviso is also made that retirement on proportionate pension should remain open without limit of time to any officer who might under the present rules have so retired upon the coming into force of the constitutional changes now proposed. It is recommended too that any changes in the statutory rules which concern officers now in the all-India services should only take place with the consent of a majority of the Council of India, which would, as hitherto, contain representatives of the services. There are in the report some apposite observations about the safeguarding of service pensions. It is regarded as certain that European recruits of the required capacity and character required can only be obtained on terms which give them—subject to one exception—the same rights, privileges, and safeguards as have been awarded to the present members of the services. The exception is the right of premature retirement, and it is an important omission. The difficulty is partly met, however, in the case of the I.M.S. by the system of optional retirement, with gratuities, after a certain number of years. If the assumption on which these observations are based is justified, it would appear that the I.M.S. has little to fear from the recommendations of the Commission. It is true that with progressive Indianisation the European personnel in all departments is likely to shrink still further, but for the present at all events the medical service is less likely than any other to be affected, and most other adverse influences have been discounted in advance. Few would be bold enough to forecast what political and other changes the next few months may hold for India, but so far as medicine in its official capacity is concerned the portents seem no worse now than they were a fortnight ago. There are so many Indians now in the service that the racial aspects, from which it has been so acutely surveyed in the past, will no longer afford the logical method of thinking—the service as a whole and not its racial make-up has to be regarded.

GLANDULAR FEVER.

THOUGH not a rare disease, glandular fever is often overlooked. At present it seems to be pretty widespread in this country, and though the cases mostly conform to type, there are several variations which may darken judgment. As first described by PFEIFFER, in 1889, it is an epidemic infection, tending to affect children and young adults, and its characteristic features are pyrexia, enlargement of lymphatic glands, and slight constitutional disturbance. H. LETHEBY TIDY and E. C. DANIEL, reviewing the subject in our columns[1] a few years ago, said that as a rule the onset is acute with malaise and fever, and that the temperature, though it may rise to 103° F. or higher, is usually in the neighbourhood of 100°. The glands commonly begin to enlarge within the first week, often at the third or fourth day, but in the present epidemic there has sometimes been no swelling until the fourteenth day, or even much later. The cervical and occipital glands are most likely to suffer, and they may be greatly swollen and tender on palpation. The enlargement, like the fever, may last many weeks, but usually the symptoms subside within a month. Many of the contemporary cases are running a long course, and often either the fever or the glandular swelling is relatively slight. A rash has been noticed in a fairly large proportion, and some have been recorded at first as examples of "an obscure exanthem."[2] In our present issue Dr. MAITLAND RADFORD and Dr. J. D. ROLLESTON describe two cases in which the rash resembled that of typhus. Apparently it is apt to appear in crops between the fourth and tenth days of the illness, and it may simulate the rose spots of typhoid. GEOFFREY EVANS and W. A. ROBB[3] have observed urticarial, macular, and papular eruptions, but while all these may lead to mistaken diagnosis it cannot be said that any rash at all is characteristic of the disease.

Lymphocytosis and splenomegaly are neither of them quite constant features of glandular fever, but a certain amount of enlargement of the spleen is usual, and there is nearly always an increase of lymphocytes in the blood, both absolute and relative. The total number of white cells is commonly about 10,000, but may rise as high as 25,000, and the bulk of them are large mononuclears with big pale nuclei and large amounts of protoplasm. There is no anæmia. The blood picture may thus be exactly the same as in the condition described as infective mononucleosis by SPRUNT and EVANS,[4] and variously recorded as pseudoleukæmia or as "acute lymphatic leukæmia with recovery" by older observers. The two diseases—glandular fever and infective mononucleosis—are now regarded as identical. The lymphocytosis is, of course, an important diagnostic guide, and the main points to look for are thus: (1) fever with little constitutional disturbance; (2) enlarged and tender glands, often with a palpable spleen; (3) lymphocytosis without anæmia; and (4) occasionally an indefinite rash. Tonsillitis is absent, though the fauces may be reddened, and the parotid is not involved. In an epidemic these features make the diagnosis relatively simple, but this is by no means true of isolated cases. The greatest difficulty lies in differentiating the condition from a "pyrexia of unknown origin" and from the typhoid and paratyphoid group of infections. In the latter the absence of lymphocytosis, a positive blood culture or Widal reaction, and a much greater constitutional disturbance may serve to make the distinction. In rubella there is no splenic enlargement, the glandular swelling is transitory, and the rash is immediate, whilst mumps, and septic glands due to tonsillitis and the like, should be readily identifiable. Glandular fever is unlike leukæmia in that it does not cause the same degree of illness and there is no anæmia. The glands may feel like those of Hodgkin's disease, but are nearly always tender; they are never known to suppurate like septic glands or caseate like tuberculous glands.

Of the ætiology of glandular fever little is definitely known. The disease is unquestionably epidemic, but is not very contagious, and patients can be safely nursed in a general ward. Spread in schools and institutions is more probably attributable to a common source of the infection than to direct contagion. The incubation period has been placed at between five to seven days, but is now thought to be considerably longer, and may well be four or five weeks. The only common sequela is a period of depression—similar to that which follows influenza. Nephritis has been mentioned as a complication, but is always unusual and is extremely rare in the present epidemic. The treatment is purely symptomatic.

[1] THE LANCET, 1923, ii., 9.
[2] Brit. Med. Jour., May 24th, p. 976; June 28th, p. 1179.
[3] Ibid., June 7th, p. 1039. [4] Quoted by Tidy and Daniel.

THE BREEDING OF MAN.

THE opening took place this week of the Animal Breeding Research Department in the University of Edinburgh, the formal declaration being made by Sir EDWARD SHARPEY-SCHAFER, emeritus professor of physiology in the University. Sir EDWARD in his address took for his text the words appropriately placed by Prof. CREW, the Director, over the entrance: "To the Advancement of Science and the Service of Mankind"; he eloquently outlined the position in which scientific genetics now stand, while with grave but amusing malice he ruled the opponents of physiological research out of any court where reason may be the judge or humanity the jury.

The department was established ten years ago, with the function to investigate the principles governing the breeding of animals employed in agriculture, but, Sir EDWARD pointed out, though primarily the encouragement of agriculture under the auspices of the relevant Government bureau had been the objective, the far-sighted view had been adopted of applying the lessons to be learned from the breeding of animals, small and large, and of plants, to the betterment of man's pedigree; while he pointed out that the direction of such studies could have fallen into no better hands than those of Prof. CREW, an opinion that will be

endorsed by all who are familiar with the Professor's text-books, or have personal knowledge of his learned enthusiasm. Sir EDWARD'S main thesis was that the principles of genetics, as we now begin to understand them, are found applicable to all animals and to all plants; the lessons derived from their study can be applied to man, so that knowledge acquired in the breeding of the horse, the fly, or the sweet-pea can be, and should be, utilised for the improvement of the human race, with the outcome that much which tends to depress that race, physically and mentally, may be eliminated. Deliberately passing over the question of birth control, he pointed to the dependence of the study of animal genetics upon physiology and biochemistry, and proceeded to explain in a vivid manner to a general audience the part played in the production of sex-characteristics by specific chemical substances circulating in the body. His main example of such influence was that of the pituitary body whose physiological activity he described as a romantic interlude, comparable, though scientifically true, to the adventure in "Alice in Wonderland," where the heroine grows larger or smaller in accordance with a definite vegetable dosage.

Civilisation cannot, at any rate yet, envisage organised endeavours to promote amelioration of the race by breeding from the highest types, while the study of eugenics reveals to us the grave risk that inferior stock may impede progress by its comparative prolificity. Meanwhile the problems, whose existence is thus implied, grow more complicated. For this reason, the hard work, with its large outlook, that is now being carried on at Edinburgh, deserves the attentive approbation of all. The breeding of man is not necessarily declared to be a mere matter of physiology, because we can see that in such physiological research as Prof. CREW and his staff are carrying on there lies a great possibility of increasing the happiness of the world. Although man may be more than an animal, there is every reason why his plight as an animal should be improved. Certain it is that any other qualities in his make-up will share in the story of development.

ANNOTATIONS

CRIME.

THE newly issued Criminal Statistics [1] for the year 1928 teach, among other lessons, the heavy price which the community has to pay for the lunatic at large. Out of 909 criminal lunatics under detention at the end of the year, no fewer than 405 had been charged with murder. In 1928 there were 56 persons arrested for the murder of victims aged 1 year and over; 9 of these 56 were found insane on arraignment (i.e., unfit to plead), and 11 were found "guilty but insane." The need of earlier diagnosis and earlier treatment is an obvious inference. Out of a total of 150 criminal lunatics received into asylums during the year in question, 54 had been found by juries to be either insane on arraignment or "guilty but insane"; only five of the remaining 96 had been certified insane before trial; 91 were certified insane while serving sentences in prison. It is hard to resist the impression that there was waste of time and money in trying persons who were already insane. The criminal law really ought to enlarge its ancient view of responsibility for crime. It should learn to recognise mental disease as a condition of perhaps long and gradual development rather than to contemplate only the sudden aspect of 100 per cent. insanity. Is it reasonable to suppose that the insanity of those 91 persons was not to be detected without first sending them to prison as convicts? After giving a comparative table of figures for 1911 and 1928 to show the sentences passed for indictable and non-indictable offences where delinquency was associated with mental impairment, the report observes that there were also many cases where, because the condition had not been diagnosed, or for other reasons, the certifiable mental impairment did not appear until the person had been sentenced. "In some of these cases the persons were removed to asylums as criminal lunatics; in others to institutions for mental defectives; but the shortage of accommodation for the latter often caused delay. If more accommodation was available and was utilised at the outset, fewer mentally deficient persons would commit offences, come before the courts, and raise the vexed question of sterilisation." This is a shocking admission by the department responsible.

The general tenor of the introduction to the statistical tables is of great interest. The Home Office, if it has to disclose increased figures for certain crimes, naturally does not want us to think that the police, the magistrates, the law-courts, or the administration are failing in their duty. Thus we are warned against fluctuations which may be purely statistical. Are more crimes reported? It may be because the police are becoming more vigilant, or because victims more willingly come forward, or because the popularity of insurance leads to more frequent complaints of loss or damage as a preliminary to a claim on a policy. In the general class of sexual offences, the figures for the full offence of rape and for the defilement of girls under 13 are lower. Here, the report suggests, the lower totals represent a genuine decrease in crime. On the other hand, the apparently serious rise in indecent assaults and the defilement of girls from 13 to 16 may, urges the official apologist, be due to a change in the moral outlook and to the greater interest taken by women in all that concerns their sex. The suggestion that women are now more ready to report sexual offences will, however, hardly explain the increase in offences between males. There seems to be a sharp rise in the offence of procuring abortion. The suicide figures are down, for the first time since the war; but attempted suicides are up. Comparisons here must be difficult, since it is the modern policy not to take proceedings for attempted suicide unless detention for a time is in the person's own interest or for other sufficient reason. The kind of offence which evilly disposed or mischievous people commit with the aid of motor-cars (often stolen) has increased sensationally—the smash-and-grab raid, bag-snatching and burglary, and house-breaking. The last-named offence seems to be committed with a certain impunity in country districts. Comparative annual totals

[1] H.M. Stationery Office. Cmd. 3581. 4s.

require, of course, to be coördinated with fluctuations in the population. The effect of the Criminal Justice Act of 1925, which enabled many offences to be disposed of summarily instead of being tried by indictment, is not easy to estimate. The official introduction furnishes useful material for attempting to understand the effect of education, the effect of the war, and the effect of shorter sentences; there is also some examination of drunkenness in relation to crime. The conclusions may not be universally accepted, but the figures cannot be ignored by the student of social conditions.

EFFECT OF IRRADIATION ON RESISTANCE TO INFECTION.

IN the June issue of the *British Journal of Experimental Pathology* Sir Leonard Hill, Prof. M. Greenwood, and Prof. W. W. C. Topley describe an experiment designed to test upon a numerically adequate sample of animals exposed to infection whether irradiation confers any immunity from fatal infection. Starting on April 24th, 1929, an infected herd was formed by inoculating 25 mice with pasteurella and adding them to 100 normal mice, housed in the type of cage employed in the study of experimental epidemics. Thereafter, three normal mice were added to the cage each day. By May 5th all the inoculated mice were dead, and no effective spread to the contact mice had yet occurred. On that day a second batch of 25 inoculated mice were added to the cage. Within the next few days some of the contacts died of typical pasteurellosis, and on May 15th the experiment began by the daily addition of three irradiated mice at the same time as the three regular controls. The treatment of the irradiated mice was as follows. The lamp employed consisted of a frosted vitrosil tubular mercury-vapour lamp, screened by a sheet of glass permeable to ultra-violet rays up to 2850 A.U., but not to shorter rays, along which on either side was placed a row of incandescent lamps sufficient in number to balance the blue light coming from the mercury-vapour lamp and produce colours—e.g., of flowers, equivalent to those produced by sunlight. The animals were placed in cages four feet below the lamp and exposed to the light for 48 hours. A fan was kept running to keep the cages cool. The cages were at first covered with gauze which allowed about half the light to penetrate; later this was done away with, and on July 17th the screen of glass was removed from the lamp to allow shorter ultra-violet rays to pass. The change did not alter the negative character of the results. On August 22nd six normal controls and no irradiated mice were added but, with this exception, there was no departure from the rule of adding daily three of each class. On Oct. 30th the last batch of immigrants was added, and on Dec. 31st the surviving members of the colony were killed. The tables supplied of the general vital statistics of the community show that the course of events differed in no significant way from that usually observed in such colonies. The planning of the experiment admitted of a direct comparison of the fates of normal and irradiated mice. Thus of the entrants to the community down to July 16th there were 189 irradiated and 189 normal mice admitted on the same days, and all of these died before the experiment was brought to an end. The mortality of the irradiated mice from the specific infection was insignificantly less and from other causes insignificantly greater than that of the control mice. The average lifetime of the controls was rather greater, when all causes of mortality were considered, than that of the irradiated mice. When mortality from all causes save the specific infection was ignored the two expectations of life were identical. It is clear that in this experiment, which involved the use of more than 1000 mice, irradiation conferred no advantage upon the treated animals in respect of the hazards to which they were exposed. To the possible criticism that the mice were not shaved the authors have a cogent answer: exposure of the naked parts of the head and feet to irradiation suffices to protect young rats fed on a rickets-producing diet against rickets, and it would therefore seem probable that the mice used in this experiment received an effective exposure, so far as the antirachitic effect can be accepted as a criterion of adequate dosage.

These negative results of irradiation with mice correspond with those of guinea-pigs recorded in the annual report for 1929 of the Lister Institute of Preventive Medicine. A pneumococcal infection among the breeding stock of this Institute, to which reference was made in the report for 1928, still persists, though not to any serious degree. A statistical analysis of the results of irradiating one-half of the breeding stock by means of a mercury-vapour lamp during a period of 12 months has been completed with the coöperation of Dr. P. L. McKinlay. No evidence was obtained that irradiation reduced the incidence of the infection or had any beneficial influence upon the general health and fertility of the animals.

The question whether exposure to ultra-violet light has any general beneficial action on the animal or the human body, apart from its specific effect on rickets, is still hotly debated, and more controlled investigations of this kind are needed. That benefit is felt by individual patients is undoubted. But, as with Hamlet's ghost, the problem whether the phenomenon is objective or subjective remains unsolved.

LIVER EXTRACTS IN DIABETES.

THE surprising success of oral administration of liver in pernicious anæmia has naturally fostered the hope that other diseases might respond to this treatment. Some 12 months ago H. Blotner and W. P. Murphy observed that liver, in spite of its relatively high content of carbohydrate and protein, is capable of lowering the blood-sugar when administered by the mouth, and they now record [1] further experiments bearing on the nature and action of this hypoglycæmic principle. In a series of diabetic patients they have studied the blood-sugar curve under the following circumstances: (1) after administration of extracts of liver treated in various ways; (2) after hypodermic injection of insulin; and (3) without insulin or liver extract. The curves were constructed from blood-sugar readings taken immediately before and at intervals during eight hours after a fixed meal consisting of 20 g. carbohydrate, 40 g. protein, and 35 g. fat. They find that an aqueous extract, prepared by soaking pulped liver in water at pH 4·6 to 5·2, and at a temperature of 35–40° C., contains the active principle which lowers the blood-sugar. Evaporation of this extract to a paste or a powder at 80° C. does not destroy the active principle, but exposure to heat above 80° C. causes it to deteriorate rapidly. They also observe that a precipitate forms after heating an aqueous extract at 80° C. for a few minutes, and that this precipitate contains almost the whole of the active principle. Incidentally, since the precipitate contains

[1] Jour. Amer. Med. Assoc., June 7th, p. 1811.

no sugar, while the supernatant fluid contains an appreciable quantity, this furnishes a simple method of getting rid of the undesirable carbohydrate. The effect of liver extracts on the blood-sugar is by no means startling. The equivalent of 500 g. of liver has roughly the same effect as 10 units of insulin, and the symptoms of hypoglycæmia have not, so far, been observed. Moreover, a lowered blood-sugar does not of necessity imply that the patient is receiving benefit. Nevertheless, it seems likely that liver extract will prove to be of practical value. In the severe grades of diabetes it may never be more than an adjunct, but perhaps the concentration can be further increased. The necessity of giving insulin by injection is a disadvantage which everyone is anxious to avoid.

THE TRADER'S ACCESS TO THE TOWN DRAIN.

APPOINTED in November, 1927, the Joint Advisory Committee on River Pollution published in the following July its first report [1] dealing with the question of machinery and of the units best adapted to enforce the prevention of pollution. Its second report [2] deals with the problem of trade effluents in local sanitary authorities' sewers. The recommendations are based on existing provisions in local Acts; as is well known, experiments in public health and other matters are often given a local trial and found worthy of more extended application. The Joint Advisory Committee comes out frankly in favour of giving the trader a definite right to discharge his effluent into the sewers and of requiring the local authority to receive and dispose of it. This is the principle introduced in the Halifax Corporation Act of 1905 and various other local statutes since then. Certain substances are still to be excluded from the sewers; petroleum-spirit and liquids of abnormally high temperature cannot be received without risk of danger and nuisance. This exclusion, it is proposed, should be strictly maintained as contemplated by the existing general law. The local authority by a system of agreed local regulations is to secure that the effluent received shall be tractable and that the necessary sedimentation or other preliminaries shall occur before discharge; it is to have power to regulate the rate and volume of discharge, to impose reasonable charges and to provide for measuring quantities, inspecting effluents and taking samples. The local authority is also to have power to remove sludge or other deposited matter from the trader's premises; such matter will be produced in complying with the regulations and the removal of it is a service for which the trader is expected to be willing to pay. Among consequential recommendations is one to permit the local authority to enter into special agreements with individual traders. Existing written agreements for disposal of effluents for valuable consideration are to be safeguarded, and, where any trade effluent is already discharged into the sewers, the trader is to be deemed to have required the local authority to receive and dispose of it under the new principle. If capital works are necessary on the trader's premises to enable him to carry out preliminary treatment, the report suggests that local authorities be allowed to undertake such works on request and at his cost, and to advance him the amount of the expenditure on terms to be agreed. An excellent point here is that, if the trader provides works on his premises for the preliminary treatment of his effluent, in order to comply with the local authority's regulations, he ought not to find that his costs of production are thereupon increased by the increased assessment of his premises for rating purposes.

The exact purport of the Committee's present recommendations can be seen from a set of draft clauses appended to the report. They are not framed as a draft Bill and they are not to be taken as the last word in verbal form, but they are a useful summary. The report recommends fresh legislation of a universal and not of an adoptive nature. Local authorities may find it desirable to combine for these purposes and this they will be encouraged to do. It seems reasonable to hope that the new plan will have a better aggregate effect on the river. Efficiency ought to be greater if treatment is concentrated in a single centre under the control of the local sanitary authority. The present scattered system expects a number of manufacturers to purify their effluents separately; but their interest is in manufacture not in sewage disposal, and a small factory with a moderate daily volume of effluent often cannot afford a whole-time qualified staff for purification. Plainly the treatment and disposal of trade effluents should be the normal function of the local sanitary authority which already must receive and dispose of domestic sewage. Moreover, in a few cases the chemical or bacteriological nature of the trade effluent causes treatment to be cheaper and more efficient if there is dilution with ordinary domestic sewage. The crux of the new plan is to get rid of Section 7 of the River Pollution Prevention Act of 1876 and to clear away legal entanglements by giving the trader the right to discharge his effluent while obliging the local authority to receive and dispose of it. The idea is worth trying. It will give anglers new hope, while the general public may expect some restoration of ancient amenities even if their rates will cost them more, and the cause of public health should be served.

[1] See THE LANCET, 1928, ii., 562.
[2] H.M. Stationery Office. 6*d*.

PROGNOSIS IN MENTAL HOSPITALS.

THE ability to forecast the fate of a person entering a mental hospital is important not only for the patient and his friends, but also for the administrators, who have to study their future accommodation. The State Charities Aid Association in New York has investigated the expectation of hospital life on first admission, and Dr. R. G. Fuller reports [1] on the fate of six groups, each of 600 male and 600 female patients, representing consecutive first admissions over a varying period beginning on Oct. 1st, 1909. The six groups chosen were manic-depressive, dementia præcox, senile, arterio-sclerotic, alcoholic and general paralytic, as the most important numerical groups in the State hospitals. All the cases have been observed over at least 15 years, and the results are set out in six statistical tables showing the number still in hospital, the number discharged, the number dead, and the relative proportions. It appears that more than half the general run of mental patients are out of hospital within a year of their admission, and that nearly three-quarters leave within five years. The manic-depressives seem either to be discharged within three years or to remain the whole period of 15 years. More than half the manic-depressive, senile, arterio-sclerotic, and alcoholic patients are out of hospital, either dead or discharged

[1] Psychiatric Quarterly, April, 1930.

at the end of nine months, though of course some of those discharged will return. As would be expected, the dementia præcox patients show the greatest proportion remaining in hospital at the end of a year; more than two-thirds of them fail to obtain a discharge. In every group there is a slowing of the rate of reduction in the number of patients in hospital in succeeding years. The first-year drop is a sharp one, the second year's is also sharp, and the rate gradually decreases to the end of the fifth year. From that point a reduction is extremely slow for general paralytics and manic-depressives, and for all groups it is slower in the second five years than the first. The great diminution in the numbers of senile and arteriosclerotic patients in hospital throughout the whole 15 years' period is largely due to the high death-rate; discharges are relatively few. The number and proportion of women exceeds that of men for every period and group, the difference being most marked in the senile group. A remarkable number of manic-depressives die soon after their first admission, though their prospects of recovery and permanent discharge are much better than those of the dementia præcox cases. These show about the same death-rate at the end of the period, having made it up in later years. Female deaths exceed male deaths at every period in the dementia præcox group. As is well known to psychiatrists, there are more permanent discharges in the first year than in all the succeeding 14 years. Further comparisons and contrasts might be drawn from these tables; the figures on the whole serve to prove the well-known facts of mental hospital life.

THE HYGIENE OF MENSTRUATION.

SIX thousand replies have been received to a questionaire on menstrual experience issued either directly, or through parents or teachers, to girls attending day and boarding schools in Great Britain by the London Association of the Medical Women's Federation. The correlation on statistical lines of the information received has been laborious, especially since the questions were framed under peculiar difficulties. In order to avoid disturbing the children no detailed questions were permitted, and such interesting matters as the age of onset, the presence of menorrhagia, and the type and site of pain could not be ascertained, though some children gave unsolicited information that the pain was slight or severe. Especially in those who complained of pain *after* the period the suspicion arises that local discomfort, smarting, or soreness, may have been meant, rather than abdominal pain. The most important practical point which arises from the inquiry is the need for better provision of facilities in schools and even in pavilions of playing fields for menstruating girls. The reticence about the hygiene of the menstrual period among women of all ages has been, and still is, a grave handicap in the way of abolishing bad traditions and of teaching young girls a régime conducive to health and comfort. The prejudice against baths during the period is only being broken down slowly, and the necessity for increased rather than diminished cleanliness at this time has hardly yet spread among the less educated. Nor is the young girl always properly taught to avoid the chafing which is often an intolerable plague to the schoolgirl. This may be particularly troublesome to the girl with a profuse flow, to the stout girl, or to the quite considerable number in whom the period is accompanied by a slight bladder irritability. It may need years of experience to teach a girl that this distress is unnecessary. A bath or a wash morning and evening, the use of simple dusting powders or ointments, and the selection of a soft material for the diaper should prevent any local irritation, more especially if a change of towel is available in the day time. Facilities have been immensely improved of recent years in factories, thanks mainly to the welfare workers during the war, in public lavatories at stations, in large shops, &c., and even in offices where large numbers of girls are employed. Slot machines, with enamelled bins for the disposal of soiled towels, are now found in many such lavatories, to the immense benefit of women clerks and shop girls. The schools and playing fields lag behind in this respect. Even such trifles as the use of an elastic rather than a rigid belt to hold the towel should be gone into. A further point of importance is to convince mothers and girls that menstruation ought not to be disabling, and that if it is treatment should be sought and persevered in as for any other ailment. Oddly enough, in spite of all experience to the contrary, many women still think that pain and disablement at this time are a rather meritorious and interesting sign of femininity, and they resist all suggestions for treatment. The fact that pain seems to become more common as the girl grows older adds point to the suggestion made in the report that the inquiry ought to be pursued to cover women over 18. The questionaire might be made more precise when the limits of menstrual disability could be more readily ascertained. Girls living at home, students at universities, nurses working in hospitals, and women employed in business would form suitable groups. It is to be hoped that the London Association of the Medical Women's Federation will pursue their inquiries under expert statistical guidance.

HOME SERVICE AMBULANCES.

THE service of ambulances established by the Order of St. John and the British Red Cross Society, and now entering on its twelfth year, has justified its existence 847,065 times since its origin, by transporting that number of persons to hospital or to their homes. At the present time 343 stations form a chain of service from Northumberland to Cornwall, and though the committee makes no claim to perfection as yet, a steadily increasing number of calls are being met by a gradual extension of the service. The aim is to provide transport for the sick and injured in those districts of England and Wales where no other service is available, but with the rapid increase of motor traffic the ambulance is most frequently in demand for cases of accident. The work of the ambulance service in these cases is supplemented by the first-aid given at dressing stations, and by the voluntary assistance of members of the Order and the Society who patrol the roads during week-ends and bank holidays. First-aid boxes are being set up by the roadside in large numbers, and members of the St. John's Ambulance Brigade and the British Red Cross Detachment living near main roads are urged to keep a supply of dressings in readiness. A mobile X ray department has proved useful in those cases where removal to hospital or to an X ray installation is inexpedient. The plates are developed immediately in the dark-room of the car, and are later submitted to an expert radiologist. The only charges made for the use of ambulances are sufficient to cover the running costs and maintenance, with a small contribution towards a sinking fund for

their replacement when worn out; the members of the Order or the Society who staff the ambulances give voluntary service. Grants are given towards the cost of providing ambulances at the request of county representatives, and subject to certain conditions of maintenance and insurance. When it is remembered that 170,000 persons were killed or injured in road accidents during 1928, and that there is every possibility that this number will increase for some years to come, the extension and perfection of this ambulance service becomes a matter of individual concern.

THE TREATMENT OF VENEREAL DISEASE IN THE EAST END OF LONDON.

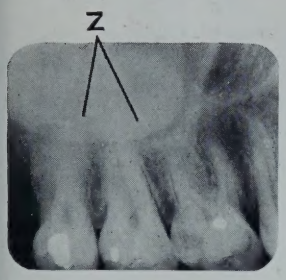
IN 1914 the treatment of gonorrhœa in a systematic manner was first undertaken by Mr. Frank Kidd in a very small room in the out-patient department of the London Hospital. The work was not at first officially recognised, but nevertheless it rapidly attracted a large number of patients. Mr. Kidd was assisted at first by Mr. E. C. Lindsay and Mr. G. Neligan, and later by Mr. R. Love and Dr. E. R. T. Clarkson. In 1917 a department for the treatment of gonorrhœa was officially instituted under the supervision of Mr. Kidd as chief of the Genito-Urinary Department. Dr. Malcolm Simpson was appointed chief clinical assistant in the women's section, and Dr. Clarkson chief clinical assistant in the section for male patients. In 1920, owing to the resignation of Mr. Kidd from the staff of the London Hospital, Mr. Hugh Lett became surgeon in charge of the Genito-Urinary Department and also director of the gonorrhœa section. The junior clinical assistants during the régime of Mr. Kidd were deliberately selected from the ranks of general practitioners and of London Hospital men who had recently qualified. The average number of junior clinical assistants was usually two in the female and five or six in the male section. Dr. W. S. Dwyer acted as registrar of the male section. The bacteriological work was carried out in the clinical laboratory of the hospital and in the bacteriological laboratory. Important changes in this centre have now been made. On Jan. 1st, 1930, Dr. Malcolm Simpson and Dr. E. R. T. Clarkson resigned their posts as senior clinical assistants but continued to work in an honorary capacity until April 1st. After prolonged negotiations, of a very involved nature, the annual grant of several thousands of pounds, contributed by the London County Council towards the work of the clinic carried out under the auspices of the London Hospital, was withdrawn, and we understand that on July 1st, 1930, the clinic ceased to have any direct association with the London Hospital. It has been taken over and staffed by the London County Council as an "ad hoc" institution for the treatment of gonorrhœa and syphilis under the directorship of Dr. T. Anwyl Davies, formerly senior assistant to St. Thomas's Hospital venereal disease department. Dr. Anwyl Davies has appointed as his senior assistants Dr. A. J. King on the male and Dr. N. Mascall on the female side, with two junior assistants, and the pathological work of the clinic will be done by Dr. I. N. O. Price. The clinic will continue to be housed in the lower storey of a block of buildings recently erected by the London Hospital, the upper part of which is occupied by house officers and the domestic staff. The L.C.C. will pay rent to the hospital for the use of the premises which will be supplied with a new entrance leading into a side street adjacent to Whitechapel-road. Henceforth the clinic will be known as the L.C.C. Venereal Diseases Clinic at the London Hospital, Turner-street, Mile End, E.1.

THE EFFECT OF SAVING INFANT LIVES.

OUR success in the fight against infant mortality has certain conspicuous gaps. Speaking at the opening session of the National Conference on Maternity and Child Welfare at Friends House, London, on July 1st, Miss Susan Lawrence, M.P., described it as having a patchy distribution over the country, while Dr. T. H. C. Stevenson explained that neonatal deaths, which are less influenced by environment than the later deaths, are highest in rural districts, with a progressive improvement up to county boroughs. The inclination to regard reduction of the early infant death-rate as hopeless, he said, is not justified. The death-rate of the first month has already been brought down from 40 per 1000 in 1906 to 31 in 1928, while in the latter year Bath had a neonatal death-rate of 22, as compared with Walsall's 50, which showed that these deaths were not inevitable. Mrs. C. B. S. Hodson pleaded that infant mortality should be considered as part of a longer curve of mortality. From a biological point of view, she said, stillbirths and natural abortions cannot be separated from early deaths. Two factors always enter in—viz., constitution and environment—and there may be a point beyond which it is impossible or inadvisable to reduce early infantile mortality. Not only is a drop in birth-rate always accompanied by a drop in infant deaths, but there is a higher incidence of natural abortion and stillbirths for every parity. The interval between births is another factor of great importance, for Woodbury's investigation showed that infant mortality was lowest where births occurred at four-yearly intervals, though personal health and circumstances must of course be considered. Mrs. Hodson aroused some controversy by stating (with statistics) that there is no evidence that reduction of infant mortality connotes a reduction in the damage rate among children. She pointed out that the number of school entrants in London who can be classified as A 1 is falling steadily, and that, comparing the years 1914 and 1926, the amount of chorea, heart disease, and rheumatism among school-children has risen by nearly one-third. She further quoted Sir George Newman's report to the Conference on Mental Health to the effect that 10 per cent. of our population shows mental subnormality of some degree, and that the only cause he could suggest was that we had been saving 40,000 babies a year. This we must continue to do, but Mrs. Hodson urged a careful use of birth control for the wise spacing of families, and of sterilisation for those evidently unfit to bear children. Dr. Harold Scurfield expressed amazement that school entrants should be found in a worse condition than formerly, but Mrs. Hodson reiterated that, speaking for London alone, though the children were heavier and better cared for, a larger proportion arrived at school suffering from some constitutional defect calling for medical attention. Dr. S. G. Moore said that an inquiry made by him some years ago had proved that there was a reduction in deaths in each of the first five years of life, and suggested that closer scrutiny might be responsible for apparently less satisfactory figures.

FAR EASTERN MEDICAL CONGRESS.—The meetings of the Far Eastern Association of Tropical Medicine are held at intervals of two or three years. The last congress met at Calcutta in December, 1927, and the 1930 congress is to be held at Bangkok, from Dec. 7th–13th. The congress will be opened by one of the royal princes who is also Minister of the Interior.

I. A



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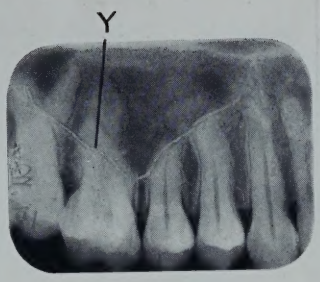

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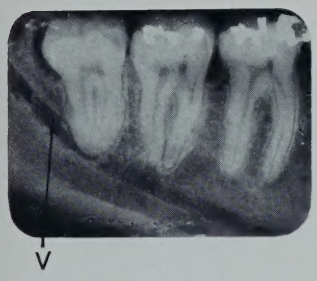

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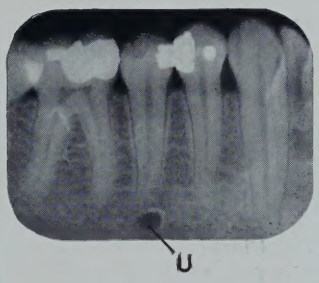

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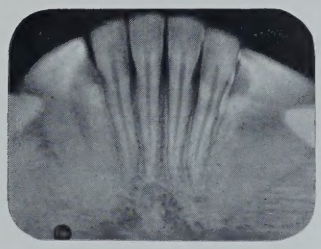

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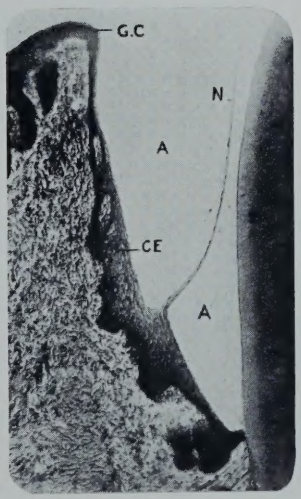
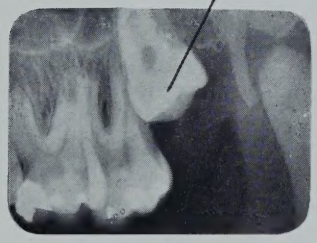
III. C



IV. A



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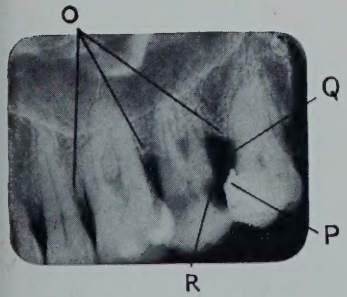
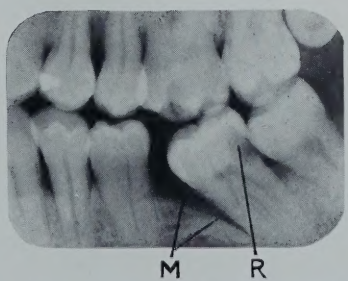
VI



VII

VIII. A



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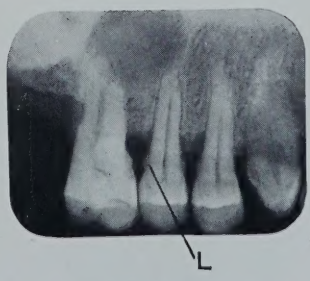
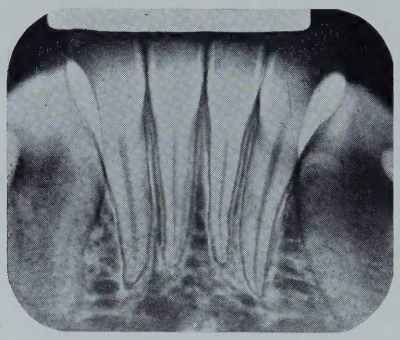


MR. C. BOWDLER HENRY: INTERPRETATION OF DENTAL RADIOGRAMS.

IX. A



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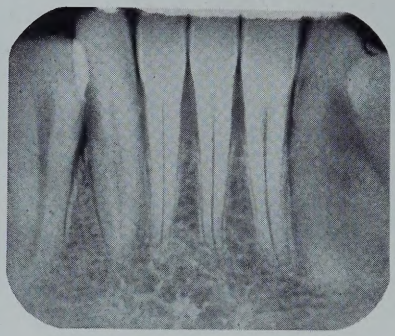
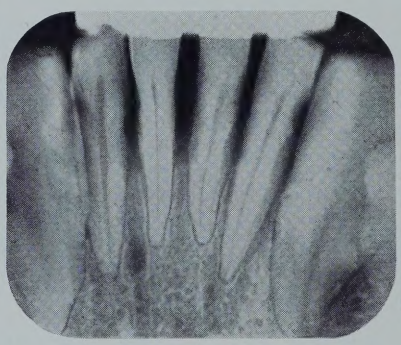


IX. E

IX. D

IX. C



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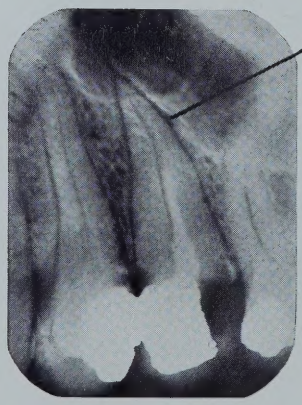
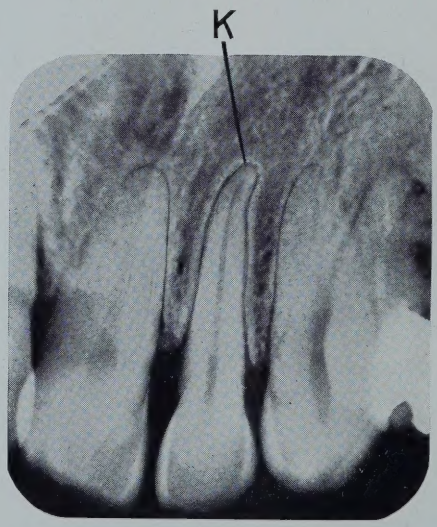
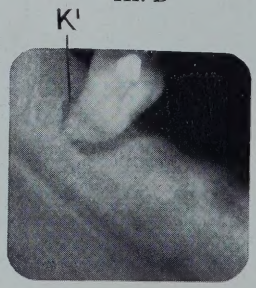


XI. A



XI. B



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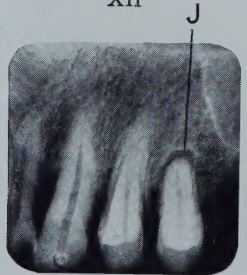

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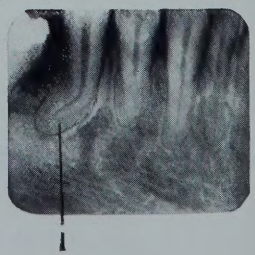


MR. C. BOWDLER HENRY:
INTERPRETATION OF
DENTAL RADIOGRAMS.

CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS

(A Series of Special Articles Contributed by Invitation.)

LXXIX.—INTERPRETATION OF DENTAL RADIOGRAMS.

(WITH ILLUSTRATIVE PLATE.)

PART I.—General Observations.

AT the outset it should be appreciated that a radiogram is but one link only in the diagnostic chain, and though it be a very important one, its value is directly proportional to its proper usage as one component of a whole. To condemn or to exonerate questionable teeth upon their radiographic appearances alone is to do so upon insufficient, and sometimes faulty, evidence.

When it is at all feasible, radiographic findings should be correlated with the results of a clinical dental examination. Dental surgeons and their patients sometimes suffer when a doctor, after a cursory inspection of dental films, expresses an opinion, often founded on an incorrect interpretation, contrary to the considered advice of the dentist. It is highly desirable, therefore, that the doctor should be versed in the interpretation of dental radiograms, so that he can correlate them with the clinical reports and decide on appropriate action. Though dental sepsis may not be sufficiently potent in a particular case to cause a secondary lesion, it is capable, even in mild degrees, of swinging the balance, and it may also put an effective drag on recuperation. Dental radiograms should therefore be taken in all cases of debility or chronic ill-health.

The practice of radiographing suspicious teeth and ignoring edentulous spaces is unwise; to take the patient's word that he is edentulous is often to miss a hidden source of focal infection. At the Mayo Foundation all patients are submitted to a dental examination, which includes a full set of films, as a matter of routine.

EXAMINATION OF DENTAL FILMS.

It is not sufficient to hold dental films casually to the light and note only the gross changes, such as impacted teeth, the outline of cysts, or the presence of obvious apical rarefaction. The films should be examined first generally by the naked eye and then critically with a lens over a suitably diffused source of light, such as an opal glass electric lamp

DESCRIPTIONS OF ILLUSTRATIONS ON SPECIAL PLATE.

PART I.

The illustrations show one-half of a fairly normal set of dental films, some examples of errors of interpretation which may arise through taking radiograms from an incorrect angle, and some teeth with caries and periodontal disease. Some of the teeth have had fillings, shown as radiopaque (white) clearly defined areas.

FIG. I.—(A) Malar process often casts a radiopaque shadow (Z) over the apices of the upper molars.
(B) The antrum, delineated by an even line (Y), is in close proximity to the premolar and molar roots. In order to display the antrum this film was taken from an angle which makes the premolars appear foreshortened.
(C) Shows the canine, lateral, and central incisors, from left to right of film.
(D) Shows anterior palatine fossa (W) in correct position between the apices of the central incisors. The nasal fossæ are in close relation to the apices of the central incisors.
(E) Shows same fossa (W) superimposed upon the apex of the right central incisor, and might be mistaken for area of rarefaction. This film, of which the left half only is reproduced, was taken to show the lateral incisor. The angulation, therefore, was incorrect for the central incisors. This shows the need for taking enough exposures to obtain correct angulation.
(F) Inferior dental canal (V) shown below apices of molar teeth.
(G) Mental foramen shown as a dark patch (U) between and below apices of first and second premolars.
(H) Lower incisors.

FIG. II.—Foreshortening of the image of the upper central incisors (the same teeth as shown in Fig. I., D) due to using too high an angle. Foreshortening and absorption with regeneration of bone are easily confused, and confirmatory radiograms are desirable in all cases where foreshortening occurs.

FIG. III.,C.—Photomicrograph of the amelo-gingival junction in a young dog. Nasmyth's membrane can be seen sagging towards the tooth, the subjacent enamel having been dissolved away. The epithelial barrier formed by the junction of the membrane and epithelium of the gingival trough is the first defence to be broken by the ingress of pyorrhœa. A = Space created by the solution of the enamel. N = Nasmyth's membrane (enamel cuticle); the membrane collapsed towards the dentine on account of loss of support when the enamel was dissolved. G.C. = Gingival crest. C.E. = Crevicular epithelium.

FIG. IV.—Upper and lower third molars (T) in a boy aged 17. Owing to lack of developments antero-posteriorly in the jaws these molars are unable to erupt into normal position. The inclination of each presents the commonest variation. The lower is locked with the second molar and has prevented it from erupting normally. This boy's only sister (older), his mother, and his mother's brother had similarly impacted third molars.

FIG. V.—The mental foramen (S) is subject to variation of position and may appear in close apposition to the apex of the second premolar simulating a pathological area of rarefaction.
The first premolar in this film exhibits an advanced stage of local periodontal disease aggravated by traumatic occlusion with the teeth of the opposing jaw. Note the loss of alveolus and the open funnel-shaped socket produced by the marginal rarefaction.

FIG. VI.—Caries (R) in distal aspect of second molar shown as a black patch. Ragged edge (P) to faulty filling has encouraged food stagnation with production of a deep pyorrhœa pocket (Q). Advanced periodontal disease between molars in a patient of good resistance, who has put up a sclerotic barrier in the cancellous tissue of the septum (O).

FIG. VII.—Caries (R) below a filling shown as a dark radiolucent halo. Death and putrefaction of the pulp has led to chronic apical infection (N).

FIG. VIII.,A.—Shows evil following extraction of first permanent molar, viz.:—
(1) Occlusion with the opposing upper molars is thrown out of gear. Therefore loss of natural function and cleansing.
(2) Food impaction between the molars has produced caries (R) and an incipient pocket.
(3) Food stagnation under the tilting side of the crown has produced a deep pyorrhœa pocket (M). Ultimately the tooth will be lost.

FIG. VIII.,B.—Periodontal disease produced or aggravated by subgingival tartar (L) seen as projections on the side of the roots with well-defined pockets below.

PART II.

FIG. IX.—Progressive stages of periodontal disease destroying the alveolar sockets commencing at the margin in the incisor (A, B, C, D), and molar regions (E, F) of the lower jaw. Note the well-defined spurs of bone coming up between the teeth in IX., A, and disappearing in the remaining ones till the last one shows the teeth ready to fall out.

FIG. X.—General enlargement of the periodontal membrane (K) around a devitalised tooth.

FIG. XI.—(A) Shows the earlier stages of generalised thickening of the periodontal membrane (K) without loss of bone and often accompanied by a sclerosis of the lamina dura.
(B) Later stage of the same condition, sclerosis having extended into the neighbouring cancellous tissue, but rarefaction accompanied by the formation of a granulomatous membrane K', and loosening of the tooth has supervened.

FIG. XII.—A crescentic area of rarefaction (J) over the apex of the second premolar. This condition is of periodontal *not* pulpal origin and the tooth is absorbed not foreshortened—cf. Fig. II. It was removed under aseptic conditions, and three ampoules of broth inoculated with the first blood taken in a pipette from the apex of the socket gave a pure growth of *Strep. viridans*. The apex of the tooth also gave a scanty growth of the same organism in pure culture.

FIG. XIII.—Proliferation of cementum (exostosis) due to irritation of the cementoblast cells of the periodontal membrane, giving rise to swollen bulbous roots (I).

or preferably a proper viewing box. The films should be the best procurable. Even when the definition of the radiogram is very fine, imagination must play a large part in visualising the morbid anatomy of the parts seen, and therefore mediocre radiograms are misleading. Only the central portions, where the rays have penetrated the tissues and impinged upon the film with correct incidence, should be used, and the outer portion of a film where the image may be distorted should be discounted. A sufficient number of exposures should be made to make this possible. Twelve of the stock size dental films is, in my opinion, the minimum, supplemented when occasion arises by two more and by stereoscopic films of uncertain areas. The doctor should make it his duty to learn, by watching dental films being taken, the relative positions of tube, tissue, and film for the various groups of teeth in the average mouth.

Examples of the importance of taking several views are illustrated in Fig. I., E, where the shadow of the anterior palatine fossa has been transposed behind the apex of the lateral incisor, giving rise to the appearance of an apical rarefaction; and in Fig. II., where by using too acute an angle of incidence the radiologist has produced an appearance of foreshortening which resembles a type of absorption of the roots of the teeth occurring in one manifestation of dental sepsis. The desideratum is that the shadow of a tooth projected on to the film should appear identical in length with the tooth, but, as the dental film cannot be placed in an ideal radiological position, the factors of human judgment and error cannot be entirely eliminated. Some radiologists tend to foreshorten the images of certain teeth, whilst others tend rather to elongate them.

With the films upon a viewing box in a suitably darkened room a general inspection should be made first to note general characteristics not merely of the teeth themselves, but particularly of the periodontal membranes and of the cancellous tissue of the jaws in this region.

FIG. III., A.

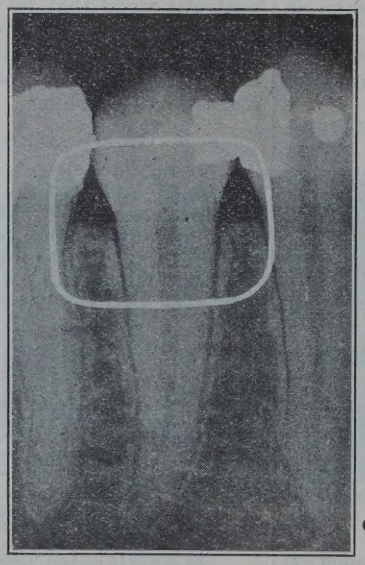
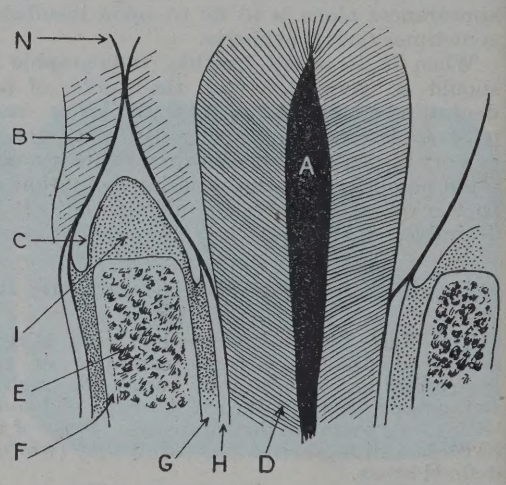


FIG. III., B.



III., A.—Enlarged radiogram of one of the normal premolars shown in Fig. I. A diagram of the framed portion is shown in Fig. III., B.

III., B.—A = Pulp. N = Nasmyth's membrane, an epithelial layer covering enamel (B) and reflected on to gum at the termination of the enamel in the gingival trough. C = Gingival trough lined by epithelium (see Fig. III., C). D = Dentine. I = Interdental papilla not visible in X ray, greatly filling space between the teeth. E = Cancellous bone of interdental septum. F = Lamina dura which appears as white line in X ray and is continuous over top of septum to the next socket. G = Periodontal membrane which appears as black line in X ray. It has strong fibrous bands which sling the tooth in the socket. H = Cementum which secures the ends of the fibrous bundles to the dentine.

A General Survey.

In the general preliminary survey the following points should be noted:—

1. The arrangement of the teeth in relation to the normal position (see Fig. I.). In the normal young adult with a well-developed arch the teeth are arranged vertically in perfect order, the crowns of adjacent ones in contact but not overlapping, and the roots on all of them tapering to finely pointed apices. In length the roots are approximately twice the height of the crowns. When the premaxillary region is underdeveloped (due probably to early adenoids) the arch of the teeth is pinched in this region and malposition and overlapping of the incisor teeth in varying degrees result. Underdevelopment posteriorly causes shortening of the jaws in an antero-posterior direction, when the third molars (or wisdom teeth) of both jaws are unable to erupt easily in a vertical direction and may even remain buried. They are subject to considerable variation of position. Fig. IV. shows one of the typical misplacements, the importance of which is discussed below.

2. The presence of other unerupted teeth, supernumerary teeth, and foreign bodies, and the tilt or evidence of undue stress in teeth adjacent to edentulous spaces or supporting artificial dentures.

3. The character of the osseous framework generally and any gross changes in this tissue such as sclerosis or rarefication.

4. The position of those normal structures both radiolucent and radiopaque, which act as landmarks. Normal structures may be mistaken for pathological conditions, or may be encroached upon by morbid conditions occurring around the roots of the teeth.

STRUCTURES IN THE MAXILLÆ.

The delineation of the *antrum* (Fig. I., B) by a thin layer of hard bone surrounding a radiolucent area above the molar and premolar teeth should be observed. This sinus extends sometimes as far forward as the lateral incisor, and is often mistaken for an area of pathological destruction especially when septa dividing it into loculi are present. Conversely, a small dental cyst invading the antrum may easily be mistaken for a loculus of that sinus. Stereoscopic plates and a comparison of the two sides are helpful in avoiding such errors. A large dental cyst displacing the floor of the antrum upward and filling the entire space formerly occupied by that cavity may also be unrecognised, but with this the physical signs are more apparent.

The *malar process* (Fig. I., A) often casts a radiopaque shadow over the apices of the last upper molar teeth, preventing clear definition. It should not be mistaken for an area of pathological sclerosis.

The tip of the *coronoid process* sometimes appears on an upper molar film.

In the front of the mouth the *median suture*, the *anterior palatine canal, foramen and fossa* (Fig. I., D) may be mistaken for periapical destruction above one or other of the central incisors, especially when the tooth is known to be pulpless.

The *nasal septum* often throws a radiopaque shadow across the roots of the upper incisors, and the *nasal fossæ* are sometimes observed in close relationship to the apical extremities of the central incisors (Fig. I., D).

The *canine fossa* over the lateral incisor and the canine varies greatly in depth, and radiograms of this region show corresponding variation in radiolucence.

STRUCTURES IN THE MANDIBLE.

The *inferior dental canal* is seen extending forward below the roots of the molars and premolars in Fig. I., F. Disease

of these teeth is a frequent source of chronic trouble in this branch of the trigeminal nerve, which may persist indefinitely after the teeth themselves have been removed. It will be noticed that the canal is closer to the third molar than the other teeth, a fact which is of importance in surgical procedures connected with this tooth. Impacted third molars are found not uncommonly grooved, where they were in contact with the nerve.

The *mental foramen* (Fig. I., G) is seen as a radiolucent area between the apices of the first and second premolars. Sometimes it is hardly to be distinguished, but at other times it may appear so closely applied to the root of a premolar as to simulate a morbid condition of this tooth and forms a common pitfall in diagnosis (Fig. V.). If the radiogram is of proper texture determination may be greatly aided by tracing the inferior dental canal to the foramen and by radiograms taken from different angles, coupled with the electric test for vitality of the tooth concerned.

In the region of the lower molar roots and roughly parallel to the mandibular canal, but above it, is a radiopaque band. It is a shadow thrown partly by the *mylohyoid line*, which is lingual to the molar roots, and partly by the dense bone of the *external oblique line*, which passes to the outer side. In strongly built subjects this shadow is sufficiently opaque to obscure the detail of the roots of the last two molar teeth.

Having reviewed these anatomical variations before proceeding to the critical examination, it is wise to look at the radiograms as a whole, noting any change common to them all, such as increased or decreased definition of the roots, increased or decreased thickness of the trabeculæ of the cancellous bone, general loss of the alveolar edges, the presence of any unusual degree of apical rarefaction, or of sclerosis.

Detailed Inspection.

After a general inspection radiograms of the teeth should be examined seriatim with a lens, the observer paying attention to the structures described below and shown in Fig. III., A and B.

1. *The crown.*—The enamel is clearly defined as a cap of denser material covering the exposed portion of the tooth, being thickest in the cusps on the masticating surface and thinning to its termination at the neck of the tooth, where it ends in a delicately chamfered edge (Fig. III., A and B) having no projecting ledge or sudden break. Fillings and artificial crowns should be made to imitate this smooth continuity of surface from root to crown as closely as possible, otherwise stagnation of food occurs at this rough place with injury and infection of the subjacent periodontal membrane, and ultimate caries in the root deep to the filling (Fig. VI.).

Caries beneath a filling may be seen as a radiolucent (dark) area extending even down to the pulp, and is a source of neuralgia and later of infection and death of the pulp (Fig. VII.). The position of the crown relative to its neighbours should also be noted. A slight breach at the point of contact, leading to food impaction, or undue tilting of the crown, interfering with proper cleansing, gives rise to caries (Fig. VIII., A) and to periodontal infection. For the same reason the presence of subgingival tartar should not be overlooked (Fig. VIII., B).

2. *The pulp chamber and canals.*—These should have a regular, clear outline. Secondary dentine—as an inward bulge upon the pulp boundary—or pulp nodules may give rise to neuralgia from a tooth externally normal and clinically alive. This deposition of dentine within the pulp and the much rarer destruction of dentine proceeding from the pulp outward are the only affections of the pulp which are portrayed in a radiogram. It is not possible to distinguish whether a pulp is dead or alive. When the pulp has been extirpated and the root filled with radiopaque material, such as gutta-percha, the apparent mechanical success of the operation should be observed; but a well-filled root does not necessarily mean a sterile, healthy root, for the dentinal tubules may be full of septic material. It is one stage better, however, than a poorly filled pulp chamber or than a pulpless tooth with no root filling at all.

3. The *root of the tooth, the periodontal membrane*, and the *lamina dura* of the socket should be examined together. The *surface of the root* should appear smooth and should pursue a regular course toward the apex. There should be no excrescences or excavations upon it and the apex should be moderately pointed, unless bending of the root toward or away from the rays hides it. As the dentine is denser than the bone, the shadow cast by the root obscures that of the superimposed and subjacent cancellous tissue, except occasionally toward the end of finely tapered roots, where the cancellous network may even interfere slightly with the shadow of the root apex. The *periodontal membrane*, interposed between the tooth and the wall of the socket, appears as a fine, black radiolucent) line, clearly defined and of even thickness, except at the apex of the root, and of almost the same tenuity as a hair. The *lamina dura* of the socket is seen as a thin white (radiopaque) line of compact bone covering the cancellous tissue of the alveolar processes. There should be no breach in its continuity.

4. The *crests* of the interdental septa are formed by the junction of the laminæ duræ of the adjacent sockets where they join that covering the cancellous tissue of the septum. Between the incisor teeth, where the interproximal spaces are narrow, the septal crest appears as a thin, elongated spine of hard bone formed by the convergence of the laminæ duræ of the two socket walls (Fig. I., C). Toward the back of the mouth, owing to the greater convexity of the crowns of the teeth, the interproximal spaces become broader, and here the lamina dura passes straight across from the margin of one socket to that of the next (Fig. I., G).

5. The *cancellous tissue* of the bone between and around the teeth. Its recognition is largely a consideration of the thickness of the trabeculæ, the spaces which they enclose, and their general arrangement. In the maxillæ the pattern is that of a fine, irregular small meshed honeycomb; while in the mandible the trabeculæ form large irregular spaces with a general tendency downward and forward in the premolar and molar region.[1] No definition, however, of normal appearing cancellous tissue can be given and in apparent health it is subject to considerable variation.

PART II.—Periodontal Infection.

THE earliest radiographic sign of infection of the periodontal membrane, either from the gum margin or through the root of the tooth, is a thickening of the dark line of this tissue with an increasing blurring or irregularity both of the definition of the side of the dental root and of lamina dura of the socket wall. This was pointed out by S. Colyer eight years ago.[2]

Where a marginal infection of the ordinary gingival type is taking place, there is to be seen a localised thickening of the periodontal membrane, extending a variable distance down the side of the root towards the apex. This is succeeded by a solution of the lamina dura in those portions of the sockets to be affected earliest—i.e., the marginal interdental crest—and ultimately by the disappearance of the cancellous tissue subjacent to it. Distribution of the lesion in the teeth of the denture is determined by a variety of exciting factors. The disturbance may be localised to one tooth, being produced by a ledge of a faulty filing (Fig. VI.), or by subgingival calculus (Fig. VIII., B), or by an uncleansable area below the convexity of the crown of a tilted molar (Fig. VIII., A), and perhaps aggravated in this case by the trauma of faulty occlusion. Or it may be seen affecting all the teeth to a greater or less degree in the condition of general marginal periodontal disease associated with mouth-breathing or faulty oral hygiene.

Progress of the condition consists in the thickening of the periodontal membrane, preceding resorption of the alveolar bone. Detachment of connective

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[1] Colyer, J. F., Dental Surgery and Pathology, fifth edition, 1923, chap. xxxvii.

[2] THE LANCET, 1922, i., 175.

tissue fibres from the affected surface of the root subsequently leads to "pocket" formation. The lymphatic drainage is mainly by the perivascular channels and, since these are mostly axial to the root, it follows that a pyorrhœa pocket tends to elongate towards the apex rather than to encircle the root (Fig. IX.).

The rate of extension of the disease appears to depend upon the local and general resistance of the individual. A periodontal pocket, however, should not be ignored. Under the most favourable conditions neglect of it will ultimately cause the loss of the tooth, an event of minor importance compared with the fact that the pocket acts as a portal, allowing ingress and ultimate entrenchment of infection in the cancellous bone of the jaws. Where a number of teeth are affected the area of absorption of sepsis becomes considerable.

The normal, but unobliterated, dental sulcus, situated behind a partially erupted lower third molar, may become a septic trough, forming a fertile pyorrhœa pocket which should be eliminated (Fig. IV.).

Another type of periodontal disturbance manifests itself as a *general even thickening* of the periodontal membrane. It may be localised to one tooth. In a dead one it is due to sepsis or some other irritating product diffusing through the substance of the root (Fig. X.). When it occurs around the root of a live tooth, this thickening indicates a state of chronic periodontitis, initiated by the trauma of faulty occlusion or some other mechanical force, and is significant of bacterial infection. In its earlier stages the black line of the membrane appears two to three times its normal thickness, with a corresponding thickening of the lamina dura if the resistance of the patient is good (Fig. XI., A); later, however, the membrane may appear 10 or 12 times its normal thickness, its wall of lamina dura has disappeared, and the root, instead of being clearly demarcated, has the appearance of being covered by a fluffy felt glove in contradistinction to a tight kid one (Fig. XI., B). A tooth in this state is invariably infected, and can cause constitutional disturbance. It may give rise to no local symptoms; but on examination it will be slightly loose, and if tapped lightly in an axial direction with the end of a metal instrument, it will give a dull damped note due to the cushioning of the swollen membrane in contrast to the resonant pitch of corresponding healthy teeth. In my experience there is a close correlation of this condition when it affects all the patient's teeth with intestinal toxæmia and with a raised percentage of streptococci in the fæces. In advanced cases a heavy growth of streptococci, usually in pure culture, is always present in the dental sockets. Remedial treatment of the gums and jaws is ineffective and temporary so long as the bowel remains deranged, and becomes a much easier matter and more lasting when the intestinal condition has been cleared up. The percentage counts of intestinal bacteria show an immediate drop in streptococci when the sepsis in the mouth is removed.

How far it is possible to correlate with the two definite types of periodontal lesion just described—namely, the marginal and the general—two other less easily classified disturbances, often to be seen in a set of dental films, is difficult to say. They are: (1) a condition in which an absorption of the root apex takes place, leaving either a crescentic-shaped radiolucent area capping the root in its place (Fig. XII.), or a regeneration of alveolar bone pari passu with the absorption; (2) a proliferative cementosis (due to irritation of the cementoblast cells of the periodontal membrane), giving rise to swollen bulbous roots (Fig. XIII). Proliferating cementosis may be either local round a devitalised tooth or general as a manifestation of periodontal disease.

The generalised periodontitis (previously described), which presents the swollen "fuzzy" membranes is usually not accompanied by a sclerotic reaction in the neighbouring alveolar bone and, since it is associated with ill-health of a toxic type occurring early in adult life, it may properly be regarded as periodontal infection occurring in a patient of poor resistance. In contradistinction, the type with the bulbous roots occurs usually later in life in individuals of robust constitution, and is associated with a sclerosing activity in the bone, which appears whiter than normal with thickened laminæ duræ and trabeculæ. It is seen in "gouty" people, by which adjective these teeth were formerly described. It is also toxic in origin, the only difference being the greater resistance and diminished susceptibility of the patient.

The remaining phases—that of absorption of the apex with concurrent regeneration of the bone and the similar condition, but without regeneration of bone, may be placed between the two main conditions, the former nearer the side of good resistance, and the latter towards that of poor resistance.

This radiological classification forms a useful basis for the computation of the dental sepsis present, and is of assistance in determining the form of treatment most effective in preventing persistence of it residually.

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Note.—The first part of this article appeared in THE LANCET of March 1st, where the fine detail of the radiograms was partly lost in reproduction. The third part will appear next week.—ED. L.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 21ST, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 241 (last week 266); scarlet fever, 1584; diphtheria, 1019; enteric fever, 54; pneumonia, 722; puerperal fever, 48; puerperal pyrexia, 102; cerebro-spinal fever, 13; acute poliomyelitis, 3; encephalitis lethargica, 22; dysentery, 5; ophthalmia neonatorum, 123. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 24th–25th was as follows:—Small-pox, 399 under treatment, 9 under observation (last week 460 and 11 respectively); scarlet fever, 1925; diphtheria, 2030; enteric fever, 20; measles, 549; whooping-cough, 78; puerperal fever, 23 (plus 13 babies); encephalitis lethargica, 122; poliomyelitis, 1; "other diseases," 19. At St. Margaret's Hospital there were 15 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 31 (9) from measles, 6 (3) from scarlet fever, 22 (6) from whooping-cough, 28 (3) from diphtheria, 43 (8) from diarrhœa and enteritis under two years, and 22 (2) from influenza. The figures in parentheses are those for London itself.

Fatal cases of measles were more evenly distributed, Southampton and Birmingham each recording 3. Liverpool reported 7 deaths from diphtheria. Of the 35 deaths from diarrhœa outside London 6 each were reported from Birmingham and Liverpool, 5 from Manchester.

The number of stillbirths notified during the week was 303 (corresponding to a rate of 40 per 1000 births), including 49 in London.

SPECIAL ARTICLES

BIOPSY AS A PRELIMINARY TO RADIUM TREATMENT.

By G. E. Birkett, *M.C.*, M.R.C.S. Eng.,

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There is a considerable difference of opinion as to whether a biopsy should be performed as a preliminary to radium treatment. At the Fondation Curie the procedure is carried out in every case, and no case is included in the statistical records in which positive evidence of malignancy is not obtained. This is done principally in order to obtain absolute scientific proof that the cases treated were definitely malignant. On the other hand, there are a number of workers in England who consider that it is not in the best interests of the patient for it to be done as a routine in that the removal of a piece of tissue tends to stimulate growth locally, and to bring about metastasis by opening up lymphatic channels and blood-vessels into which odd cells may be implanted by the knife. It has been my lot to have dealt with almost no other cases than those of malignant disease for the past six years. In the earlier years the cases referred to the clinic were hopelessly inoperable or recurrent after operation. A study of these latter cases has convinced me that there is nothing worse in malignant disease than an incomplete operation, and that often increased rapidity of growth and metastasis follow rapidly in its train. Cases which come to mind are those of breast carcinomata, in which only a local amputation has been performed, or in which it is obvious from the length of the scar that the axilla could not possibly have been cleared. It is little short of a tragedy to see some cases which have been treated in this way referred for treatment with extensive local recurrence, diffuse infiltration of the skin flaps, and multiple outlying skin nodules. Occasionally I have seen an early epithelioma of the skin mistaken for an inflammatory lesion and incised, with subsequent rapid local spread. Lastly, I have for a long time been struck by the history given by some patients of the hospital class with carcinoma of the floor of the mouth. First of all a "sore place" was noted, and the removal of teeth advised. After which "it became worse," and surely enough the growth had spread rapidly along the alveolar margin whence the teeth had been removed.

Dr. W. E. Gye [1] in his Lloyd Roberts Lecture referred to the experimental fact that if an implant of Jensen's rat sarcoma in a mouse would not grow, the best thing to do was to incise it. Mr. Geoffrey Keynes also has told me that he has discontinued biopsy in breast carcinoma—a procedure carried out in his first fifty cases when the radium needles were being removed—owing to the fact that in some cases implants occurred in the scar of the skin incision. There was an old adage in connexion with rodent ulcers "Noli me tangere," and I believe in the old days the phrase was synonymous with the condition. Interpreted it would seem to mean that no treatment at all is better than incomplete or inefficient treatment.

Largely for the above reasons I, personally, do not encourage routine biopsy as a preliminary to radium treatment. In order, however, to appreciate the position more fully it is necessary to consider the various common sites of malignant disease, and also to assess the possible harm which may result from an incorrect clinical diagnosis if radium treatment is given.

Buccal Cavity.

If a "lump" is present in the tongue, which is not ulcerated, with or without glandular enlargement, the diagnosis probably rests between gumma, tubercle, or malignant disease. If ulceration exists there is the same problem, whilst small, simple ulcers may occur in addition. The gumma is usually associated with other evidence of syphilis (i.e., a specific glossitis) and a Wassermann reaction can easily be performed. Even so malignant disease commonly is superimposed on a specific glossitis in the anterior third of the dorsum of the tongue, but the clinical differentiation is easy for the experienced observer. Tuberculous disease of the tongue is generally associated with well-marked and active pulmonary tuberculosis. The question naturally arises as to what is the result of radium treatment of a gumma or tuberculous disease in this situation. Commonly we treat an epithelioma of the tongue where there is an associated specific glossitis, and usually the associated leukoplakia disappears temporarily, later to return. No harm is done so far as can be observed. I have no experience of having treated a tuberculous ulcer of the tongue, but lupus vulgaris of the skin has been treated with no ill-effects. After all, radium treatment is a conservative method, and the position of the surgeon who in the past was called upon to do a partial or complete glossectomy for the condition was quite different. It seems to me that in this situation, which is notorious for the rapid spread of carcinoma to lymph glands, this spread being explained to some extent by the continuous state of "unrest" of the organ, biopsy is the last procedure one should adopt in the interest of the patient. It is true that we lose scientific proof that all the cases apparently cured are malignant, but if the clinic is a large one, then the number of patients so treated should outweigh any criticism of inaccuracy of diagnosis, which surely must be rare with experienced observers. Finally, the present method of treatment involves at most clinics a widespread removal of the lymphatic drainage area—a Crile's block dissection. From the material so removed sufficient evidence has already been obtained to confirm the clinical observation that radium can deal adequately with the primary growth in buccal carcinoma. This is not surprising when Regaud states that 65–70 per cent. of cases of lingual and sublingual carcinoma treated at the Fondation Curie showed secondary deposits in the lymphatic glands. On the other hand, the French school recommend biopsy in every case, but apart from the point that the scientific value of their records is obviously increased there seems to be no advantage to the patient in its regular performance.

Prof. G. Roussy [2] mentions the case of a gumma of the tongue diagnosed clinically as an epithelioma, which would have been subjected to a total glossectomy but for a biopsy performed at the instance of another surgeon. This criticism does not apply, of course, in the case of radium, which, as has already been noted, is a conservative method of treatment.

Roussy also describes a case in which the biopsy pointed to a chronic inflammatory condition, probably syphilitic, which was confirmed by the Wassermann

reaction. Happily a subsequent examination drew attention to other features, and a fresh biopsy showed a squamous epithelioma. The author's conclusion is that the case demonstrates the value of repeated biopsy; my own would be that the selection of the correct piece of material for biopsy depended upon the clinical skill of the observer. He also refers to the value of biopsy in the treatment of carcinoma of the mouth and tongue. Sufficient, however, is now known with regard to the histology of epitheliomata here, and the variations in type with site, for the clinician to say with a fair degree of certainty what the type and its relative radio-sensitivity will be. For instance, almost all epitheliomata of the base of the tongue are extremely radio-sensitive, and very advanced primary growths yield dramatic local results, such as are rarely obtained in the anterior part of the buccal cavity. For this reason one need rarely abandon hope here as regards the local result. On the other hand, epitheliomata of the anterior third of the dorsum of the tongue are usually superimposed upon a chronic specific glossitis, and the prognosis should always be to some extent guarded, since the response to radium is not so good as in an uncomplicated case. If the above facts are borne in mind I do not think that a biopsy is likely to improve the treatment of a particular case.

J. L. Roux-Berger and O. Monod [3] think that correct treatment is likely to be delayed without biopsy; in their experience a large number of cases is brought to them much too late for effective treatment to be given. It seems to me that their objections would be answered by the statement which I have often made that "all ulcers of the mouth and tongue which persist for more than a week or two in patients over the age of 30 should be regarded as being potentially malignant and referred for expert opinion."[4]

Carcinoma.

BREAST.

In the introductory remarks, reference has been made to the effect of incomplete operations, and most surgeons are not in favour of biopsy as a preliminary to operative treatment. On the operating table, they may, in a doubtful case, remove the tumour locally, and then incise it, but the tendency is to proceed to a radical amputation if doubt exists. Very few will actually excise a wedge for histological examination.

As regards radium treatment, there is as yet only a small number of surgeons who advocate radium treatment in early cases, and in those patients who are usually referred for this purpose the stage of the disease is such that the diagnosis is practically certain. If early cases are treated in the future there is, of necessity, bound to be a small percentage of error in diagnosis. There should be no complications and no mortality following incorrect diagnosis and treatment.

CERVIX UTERI.

In most cases clinical diagnosis is easy. Occasionally the cervix is hard and nodular, usually as the result of multiple tears and subsequent irregular cicatricial contraction, whilst there may be slight bleeding on examination from the presence of erosions. When, however, these patients are examined under an anæsthetic their true nature becomes obvious, and the removal of a piece of the cervix does not settle the matter. Indeed here is a fallacy common to all biopsies, for the information provided depends upon the clinical skill of the operator in removing the correct piece of tissue. In other words, a negative finding does not prove that carcinoma is not present except in the section examined. This is well illustrated in the following opinions collected by Dr. J. Lane Claypon.[5]

Jung (1909) reports two deaths from peritonitis and pneumonia after vaginal disinfection of the growth and before the intended subsequent operation. Death was traced to disturbance of the growth. Risley and Leland (1917) refrain from removing a piece of tissue because of the real danger of dissemination of the disease. Döderlein (1922) regards biopsy as dangerous. Bowing (Mayo Clinic) (1923) says that biopsy, if done at all, should be made just before the second radium treatment, but even so is not without danger. Heymann (Stockholm) (1924) considers that the results with radium have improved in his clinic since the practice of taking tissue for microscopical examination has ceased. Heynemann (1921) says that there are two dangers in biopsy: (1) that the cancer is missed by incomplete examination of the tissue removed, and (2) that infection arises. He lost two early cases by peritonitis after biopsy. Ochsner (1924) says: "I have been impressed with the fact that there is a marked difference in the prognosis in cases in which a portion of the cancer has been cut out for microscopic examination, and those in which the tumour has not been disturbed. The former have invariably died of metastases, even in cases in which the cancer was not in an advanced condition at the time of operation, while in the latter cases we have seen nearly permanent recoveries especially since the introduction of radium and X ray treatment." He adds that he thinks the experienced surgeon should be able to make a diagnosis without removing a piece of the growth. Kupferberg (1925) says that a biopsy or any manipulation of the growth should never be undertaken. Better take the risk of a wrong diagnosis. Dyroff (1925), dealing with the Erlangen material, says that a biopsy is less dangerous after the first ray treatment but that the clinical diagnosis as to recurrence is more accurate than the histological.

RECTUM.

There is considerable divergence of opinion with regard to the suitability of carcinoma of the rectum for radium treatment. Regaud holds the view that the adeno-carcinoma of the rectum is not radio-sensitive, and that such good results as have been obtained are due to excessive irradiation which has luckily been limited in its effects to the malignant tissue. On the other hand, Sir Charles Gordon-Watson [6] considers that the bad results in the past are due partly to poorness of access, and has developed treatment on these lines. His views on biopsy are as follows: "Whenever considered desirable a portion of growth is removed for section. In the earlier cases this was done at the time of the colostomy operation by means of a special punch. In later cases a portion has been removed at the same time as the needles. By the latter method there is less likelihood of stimulating metastasis. When early growths have been dealt with, it has been considered inadvisable to disturb the growth for the purpose of biopsy."

All observers are, however, agreed that carcinoma of the anal canal, a squamous epithelioma, is radio-sensitive and suitable for radium treatment. In growths which start at or near the anal margin a clinical diagnosis will usually suffice, but there will arise the case in which it is difficult to decide clinically whether the tumour has arisen from the rectum or anal canal. It seems, therefore, that in such cases a biopsy must be taken to decide whether one is dealing with an adeno-carcinoma or a squamous epithelioma, since excision is usually regarded at present as the method of choice in operable cases of rectal carcinoma.

BLADDER.

In bladder carcinoma the danger of implanting growths by manipulation and trauma is well recognised by urologists. A suprapubic cystostomy has usually to be performed for the insertion of radium, and the advantages of inserting radium at the same time rather than to have to wait for a positive diagnosis

from a microscopical section and to reopen the bladder are obvious.

In all the above situations, with the exception of certain cases of carcinoma of the rectum, there would seem to be but little advantage to the patient, and certainly no disadvantage in not performing a biopsy. The main objection is the lack of scientific proof; but this surely need not be necessary if results from large numbers of cases are considered, in which the error in diagnosis should be very small.

Other Tumours.

There is, however, a large group of tumours in which clinical diagnosis is difficult, and for which one cannot possibly lay down general rules. As a class one might refer to them as subcutaneous tumours. When they occur in areas known to contain lymphatic glands, as in the neck, axilla, or groin, a primary tumour elsewhere must be eliminated by careful examination. When this has been done the problem is infinitely more complex than that of any of the main situations which have previously been discussed. In the neck tubercle, Hodgkin's disease, lymphatic leukæmia, branchial carcinoma, secondary glands from a mediastinal tumour, or a carcinoma of the stomach all suggest themselves, as well as primary sarcomata of various types. Even the advocates of biopsy are against this procedure in the rapidly growing sarcomata at any rate, holding dissemination to be a real danger. If a rapidly growing tumour occurs in these situations probably the safest procedure is some form of external irradiation such as radium at a distance or deep X rays without a biopsy. In slowly growing tumours a biopsy is, one considers, necessary in order to determine the correct line of treatment. A branchial carcinoma would be treated by interstitial irradiation, a fibro-sarcoma by combined excision and interstitial irradiation, Hodgkin's disease by X rays—to give examples of the importance of a correct diagnosis. (The same line of argument is applicable to subcutaneous tumours elsewhere.)

Finally, there remains for consideration the importance of a correct diagnosis in situations in which the complications of radium treatment may be such that it would only be undertaken if no other method of treatment were suitable. Tumours of the nose and accessory sinuses are cases in point. The complications of bony necrosis following radium treatment are serious and distressing, and treatment should not be undertaken lightly. Biopsy is for these reasons preferable. Carcinoma of the larynx falls into the same category.

Healing after Biopsy.

I have recently received the following statement in connexion with biopsy before radium treatment. "Some surgeons refuse to do a biopsy because they have found that healing is much retarded by the application of radium before the biopsy wound is completely healed, and on the other hand they do not think it justifiable to delay applying the radium until time has elapsed for complete healing to take place." It is difficult for me to criticise this statement on account of my personal attitude and practice with regard to biopsy. It would be quite easy to use the statement as an additional argument against its performance, but one does not feel justified in doing so for many reasons. In the first instance one should examine the usual result of radium treatment in certain ulcerative lesions, such as carcinoma of the tongue, epithelioma of the skin, and rodent ulcer. If surgical excision were performed in any of these conditions without any attempt being made to bring the edges of the wound into apposition, would healing occur more rapidly than it does after radium treatment? I do not think it would. Secondly, one should consider the healing of wounds which follows the insertion of radium by open operation. The operation may be a standardised one such as a radical amputation of the breast or a Crile's block dissection of the neck, and radium is used as an adjunct to surgical procedure. An increase in the normal tissue exudate is noted, but so long as good drainage is provided healing is not retarded. On the other hand, the operation may be for the purpose of providing good access for the insertion of radium, and probably the best example to take is that for the insertion of radium into the lymphatic drainage area in the neck in a case which is considered unsuitable for a block dissection. Skin-flaps are reflected in the same way and the sternomastoid muscle divided and reflected upwards. After the common carotid and internal jugular have been defined a large number of needles (30 to 40) are inserted into the area and the wound closed. The wound must be reopened in seven or eight days for the removal of the radium, and patients so treated are usually discharged six days later. Another common example of the combined use of radium and surgery is the mixed tumour of the parotid gland. They vary in radio-sensitivity and tend to recur locally. Commonly they are treated in Manchester by enucleation and the insertion of six to eight needles in the wound for two to three days. I feel sure that the surgeons who like this to be done would reconsider the position if healing were delayed and an unsightly scar the result.

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ROYAL SANITARY INSTITUTE.

CONGRESS AT MARGATE, JUNE 21ST–28TH, 1930.

ABOUT 1600 delegates, members of the Institute and overseas visitors, including a large contingent from the American Public Health Association, attended this congress. In his presidential address Lord CORNWALLIS drew upon his long experience as chairman of the Kent County Council. He touched on the incomplete solution of the housing problem and its effect on agricultural labourers, and advocated the derating of small cottage property. In referring to the sanatorium deadlock, he hoped that the good work of the British Legion at Preston Hall Colony would be widely imitated. He anticipated much progress in schemes to benefit child life as the result of the establishment of the larger health unit. He looked forward to an increase in the number of voluntary health workers, and eulogised the work of such bodies as the rural community councils of Kent and Oxfordshire. The county of Kent was, he said, being urbanised in the neighbourhood of London, industrialised by recent colliery schemes, while it suffered like other parts of the country from the bungalow disease. Regional planning was urgently necessary, and a good beginning had been made in East Kent.

The congress then divided into six sections at which over 60 papers and addresses were submitted,

many of them coloured by the impending changes in local government.

Imperial Responsibilities in Hygiene.

Presiding over the Section of Preventive Medicine, Sir ANDREW BALFOUR (whose address was read in his absence by Prof. JAMESON) said that England had been termed the cradle of modern hygiene, but he was afraid that visitors from overseas might get shocks on seeing the litter in the streets and the primitive scavenging arrangements in London and some of our great cities. Compared with the Dutch we were rather an untidy and not a very cleanly people, and until sanitary education had reached a higher plane we could not set an example to others. We had, however, recently risen to our graver responsibilities in promoting the health of our tropical possessions and smaller colonies, and a remarkable change had taken place in the way the medical and sanitary needs of native populations were viewed by the Colonial Office. The study of tropical hygiene had reacted on home hygiene and had drawn attention to insect nuisances in these islands. The outlook of the teachers of the future must be widened and the student of hygiene familiarised with some features of parasitology in the tropics. The Institute, he said, had realised its responsibilities in the training of sanitary inspectors for work overseas.

Dr. M. Z. SHAFEI, representing the Public Health Department of Egypt, spoke warmly of the services Sir Andrew had rendered to public health in Egypt.

Education of Health Personnel.

THE MEDICAL STUDENT.

Dr. G. F. BUCHAN (Willesden) dealt with the education of medical students, most of whom were, he said, destined for general practice. They must have specialists as teachers, but from interest in his own specialty the specialist was apt to forget the medical students' probable future, and in consequence the resolution adopted by the General Medical Council in 1923 as to the preventive outlook was ignored. There were exceptions. Bacteriology had always been treated in relation to prevention. More recently obstetrics and pædiatrics had assumed a preventive character, and surgery was following suit. Medicine, however, stood where it did. The school medical service came into being in 1907, and a generation was growing up accustomed to medical supervision. Before long, he thought, medical supervision would be applied to the adult, and the slogan of the New York Health Department, "Go to your doctor before he has to come to you," would be translated into some practical form of preventive medicine in this country. Some 30 years ago, when he was a medical student, he learned how disease had developed from the normal, but it was never suggested that at some stage of the process it might have been possible to arrest its course. In teaching, the demonstration of the grosser lesions of an incurable disease had always been more popular, because more spectacular, than the demonstration of the obscure symptoms of an incipient and curable condition. When school medical inspection began it was thought to be a job suitable for a young man fresh from hospital. It was now realised that the detection of the early beginnings of disease was difficult for an experienced practitioner. In his opinion the future of the health of the race, as well as the future of the medical profession, lay in regular medical examination and supervision. The medical student must have better facilities for the study of the normal. The medical graduate, as things were, might be turned out capable of discussing diets for diseases of altered metabolism, but unable to prescribe a suitable dietary for the maintenance of the health of a poor family.

THE POST-GRADUATE.

Prof. W. W. JAMESON (London School of Hygiene) said the D.P.H. curriculum had changed much since it was instituted. He thought candidates should have some experience of practice before beginning such a specialised course of study, but he would like to hear opinions as to the G.M.C. rule that two post-graduate years must elapse before taking the diploma. At the London School they had instituted a part-time course which lasted one year, which included the 280 hours for the Part I. laboratory work in chemistry and bacteriology. They had also added applied physiology, which he considered of the highest importance and the basis of personal hygiene. Ventilation, lighting, and heating were best dealt with in a course of applied physiology, also nutrition, assessment of physical fitness, and industrial hygiene. They believed that they had successfully coördinated the laboratory work with the work of Part II. It was difficult to find a single public health unit where all the practical training in public health administration under a medical officer of health could be obtained, and they had met this difficulty, he believed successfully, by arranging for many special demonstrations under several health authorities and at many institutions. Their 12 months' course was part time, and he would much like to be able to establish a 9 months' full-time course which would fit in with the one year's leave of absence of the colonial medical service, and he hoped to get the consent of the G.M.C. to this modification. Anyone who took up post-graduate teaching undertook a serious responsibility, as this post-graduate work claimed the very best from the teacher. He was much in favour of short refresher courses for the senior medical members of the public health service. A great post-graduate clinical school was now being established for London. Why not have one also for the public health service?

Dr. A. S. M. MACGREGOR (Glasgow) said that the teaching hospitals admitted far too many advanced cases. He thought we should obtain the preventive outlook among practitioners more easily when the insurance system had been extended to dependants. As the medical officer of health was only to be an interpreter of results, the laboratory work in the D.P.H. curriculum might be cut down.

Colonel P. H. HENDERSON (War Office) approved Prof. Jameson's suggestion for a shortened course which would be suitable for army candidates.

Dr. E. H. CULVER (South Africa) said they had largely adopted home ideas for the curricula at their two universities, modified to meet local needs as to parasitology, &c. As a lecturer in physiology he had seen to it that applied physiology had a proper place in the Johannesburg course. In a new country they had not to fight old traditions, and thus Sir Leonard Hill's teaching was more in evidence in Johannesburg than at home, and the kata-thermometer was in use in their theatres. They also had useful fortnightly refresher courses for practitioners.

Surgeon-Commander G. H. HAYES, R.N., said the naval service was essentially preventive, and they also found the kata-thermometer useful.

Dr. W. BUTLER (L.C.C.) considered laboratory work very important for teaching accuracy, and thought they should be careful about making changes in the curriculum.

Dr. W. G. SAVAGE (Somerset) thought graduates might begin their curriculum for the D.P.H. immediately after qualifying, and that laboratory work was very important in keeping the scientific aspect in the forefront. Applied physiology should certainly be added to the curriculum. The 1923 G.M.C. resolution as to the preventive aspect was not being acted upon, and the Council must be pressed to make effective what was at present only a pious aspiration.

Prof. HAROLD KERR said the preventive aspect had permeated the Durham curriculum. He thought the public health courses for the medical student might be made more interesting.

Dr. F. MIRANDA said the work of Mackenzie was highly esteemed in Mexico, and the doctrine that it was too late to try to cure diseases when anatomical changes had taken place. The curriculum at Mexico University included both physiology and physiological pathology. They endeavoured to lay stress, not on the name of the disease, but on the nature of the deviation from the normal.

Prof. A. BOSTOCK HILL (Birmingham) said no mention had been made of propaganda, and pointed out that the public were being gra ually weaned from the bottle of medicine to the preventive outlook, thus preparing the way for periodical medical examinations.

Prof. JAMESON, in replying, again emphasised the importance of applied physiology. He also mentioned that the teachers of physiology had succeeded in having it recognised as a pure science, thus perhaps increasing the difficulty in securing a teacher for applied physiology.

TRAINING FOR THE TROPICS.

Dr. ARTHUR E. HORN (Colonial Office) put forward a convincing case for the special training of the staff, who were to work in the tropics, and deal with such diseases as malaria, yellow fever, filariasis, and schistosomiasis. A knowledge of insectology and parasitology was essential. For example, every kind of anopheline mosquito was not equally effective as a vector of malaria. In one district in Malaya, where there was a high incidence of malaria among the coolies, *Anopheles umbrosus* was incriminated—a type which lays its eggs in water thickly covered by bush. The bush was cleared away and *umbrosus* with it, but unfortunately the much more deadly *maculatus* flourished in the now bright sunny waters, and the last state of this place was worse than the first until the bush was allowed to grow again and the waters were dealt with by other means. A staff is thus required who are able to make use of the expensive lessons learned by experience. There is also much further research to do. We have more to learn about the conditions under which mosquitoes become dangerous to man. The precise cause of yellow fever is not yet known, or if a man can contract the disease by other means than the bite of an infected mosquito. No serious attempt has yet been made to eliminate the mosquitoes which convey filariasis and its occasional sequel elephantiasis. Dr. Horn went on to refer to the methods of dealing with the devastating epidemics of sleeping sickness and with ankylostomiasis, and concluded that there was at the present "great need for the study of all branches of parasitology and less demand for the finer aspects of chemical and physical analysis; a wider field for the employment of simple sanitary devices and less opportunity of employing more complicated engineering schemes."

SANITARY INSPECTORS.

Mr. H. T. PERRY (chief sanitary inspector, Kingston-on-Thames) outlined a suitable course of training for sanitary inspectors. He visualised a student leaving the county school at the age of 17 after passing a matriculation examination and spending four years in going through the routine of a health office, first as clerk and then as assistant inspector, and throughout the whole period going through a complete course in building construction and other subjects at a technical school, and sitting for his qualifying examination at the age of 21.

Mr. H. CLAY (lecturer in domestic sanitary engineering, London School of Hygiene) thought the present scheme of training was good, and that numbers of suitable young men were being turned out by the technical colleges annually who, after a period of pupilage in a health office, would make efficient inspectors. It would be an advantage if scholarships were available as in Willesden.

HEALTH VISITORS.

Miss A. A. HARRISON dealt with the training of health visitors and the changes in their work and qualifications during the last 25 years. Beginning with the same certificate of the sanitary institute as that held by men, the qualifications of trained nurse and certified midwife had been added and health certificates issued by many bodies, ending with the attempt to establish uniformity by the Ministry of Health.

Mrs. C. B. S. HODSON (Eugenics Society) advocated instruction in eugenics for health visitors, seeing that the health visitors from their knowledge of the families were in an ideal position for giving advice in suitable cases on birth control. During the discussion,

Dr. J. J. BUCHAN (Bradford) mentioned that there was a great dearth of health visitors at the present time. He was not satisfied that they had reached finality in their methods of selection. He did not think it was possible to find out the suitability of a woman for this work by any examination.

Dr. J. A. FAIRER (Leicestershire) said that up to now they had had no difficulty in obtaining health visitors as long as they paid a proper salary, but they had experienced difficulty and lost good workers when the county council in a fit of economy reduced the salaries from £180 to £150.

EPSOM COLLEGE.

THE seventy-seventh annual general meeting of the governors of Epsom College was held on June 27th, at 49, Bedford-square, when the chairman of the council, Dr. Raymond Crawfurd, presided. The scrutineers, Sir William Hale-White, Mr. W. Cyril Tomlinson, and Dr. Septimus Sunderland, reported the successful candidates as under:—

PENSIONERSHIPS.

	Votes.
*Nicholson, Mrs. Agnes A.	6987
†Cadman, Dr. Ernest S. R.	6137
†Greenwood, Mrs. Marie M.	4471
†Humphreys, Dr. Edward A.	4334

* Brodie Sewell Pensioner. † Ordinary Pensioners.

FOUNDATION SCHOLARSHIPS.

	Votes.
Taylor, David H.	15,941
Daw, Ian Almeric	11,509
White, John H. B.	10,389
Butler, Gerald A.	9,409

The secretary reported that Dr. Edward W. Forster, who was at the head of the list of unsuccessful candidates, would be appointed an ordinary pensioner

under By-law 16 at the council meeting which would be held immediately after the annual general meeting, a vacancy having arisen.

Dr. Crawfurd, in submitting the report of the council to the governors, spoke briefly of the progress of the school and the position of the medical foundation. While the annual subscriptions were slightly less, the difference could be regarded, he said, as an accident; there was a moderate surplus on the income and expenditure account, and the numbers in the school had gone up. The general story was one of progress. He alluded to the loss which the school had sustained by the death of Lord Rosebery, who was president for 29 years, and took a practical interest in its activities. In obtaining the consent of Lord Burnham to succeed Lord Rosebery he considered that the governors were to be congratulated.

The following were elected vice-presidents of the College, in recognition of valuable services rendered: Lord Dawson of Penn, Sir Milsom Rees, and Mr. T. Hollis Walker, K.C.

A cordial vote of thanks to the chairman concluded the business.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

THE LÜBECK DISASTER.

THE number of deaths at Lübeck has increased to 46, and 68 children are still gravely ill. As is often the case in this country, the sad event has become a political question. The opposition in the Lübeck Parliament moved that the men responsible for the accident should be dismissed for negligence. The motion was adjourned until the case has been fully elucidated, but criminal proceedings for bodily injury by neglect have now been instituted against the medical director of the Lübeck Health Office, and the chief physicians of the State Hospital and the Children's Hospital. The Lübeck Senate has announced that it will bear the expenses of the treatment of the infants both in hospital and at home. Prof. Calmette, in a letter to a Berlin daily paper, says that such an accident as the one at Lübeck has never occurred with B C G, and that obviously, by a regrettable mistake, the infants received virulent tubercle bacilli. Speaking at the Berlin Medical Society, Prof. Lange discussed the theoretical basis of the Calmette method without mentioning the Lübeck disaster, and stated that numerous experiments on animals and observation on patients have proved the method innocuous. Medical men were thus justified, he says, in trying its immunising action with the necessary precautions.

ZEILEIS *v.* LAZARUS.

The action of Zeileis against Prof. Lazarus, mentioned in my letter of April 5th, was recently tried before a court in Berlin. The action was originally brought to prohibit Prof. Lazarus from stating that the Zeileis method was a humbug and obnoxious, but lately the plaintiff, obviously fearing that the defendant would be in a position to corroborate his statement, only demanded an injunction to restrain him from pretending that he had studied the method at Gallspach. At the hearing Prof. Lazarus gave evidence that he had not been allowed to enter the consultation room in Gallspach, but that he had interviewed there the constructor of the apparatus, an electrical engineer, who had explained to him the technical arrangements; he had also consulted, as an alleged patient, two medical men in Munich who used the Zeileis apparatus. Showing a Zeileis tube to the court he broke it, saying that he would make an end of that humbug. The court gave judgment for the defendant, stating that Prof. Lazarus had rightly declared that he had studied the external features of the procedure in Gallspach, that he had ascertained the nature of the apparatus in Zeileis's residence, that he had become acquainted with the therapeutic methods by consulting disciples of the master, and that being a specialist in radiotherapy he was thus in a position to give an opinion on Zeileis's claims.

ABORTION IN RUSSIA.

Dr. Karlin, of Leningrad, reports in the *Archiv für Frauenkunde* on the results of legalising artificial abortion in Russia. He states that in the larger cities, where abortion is now performed in hospitals exclusively, deaths are no longer recorded, and pathological sequelæ have been reduced to a small number. In the country, however, where women, owing to their great distance from an authorised hospital, continue to apply to professional abortionists, deaths and disease are still common. Since December, 1928, a second abortion has been allowed only nine months after the first abortion. The method used is curettage with subsequent irrigation. Perforation has become unusual, and if it happens its danger is much reduced, because a laparotomy can be performed at once and the woman, being already in the hospital, is not endangered by transport. Poverty is not the only motive for women desiring to abort; there are other motives, such as the desire to be socially independent, or to give the children a better education. Some are afraid of parturition, and of the strain of bringing up children. A few only desire the operation because they are ashamed of being pregnant without being married. Although the immediate danger to life and to health has become comparatively small, Karlin is of opinion that the indiscriminate production of miscarriage must be combated, because of its later sequels. Among these are a prolongation of the first and second stage of labour in later deliveries, defects of the placenta, and deficient involution of the uterus. Amenorrhœa and neuroses are especially frequent in women who have undergone artificial abortion without a previous normal birth. The medical man should, however, consider social indications, such as poverty, numerous previous children, and divorce from the father, as well as medical indications.

The legality of operative abortion is much discussed in Germany, where a reform of criminal law is now in preparation. The matter is treated not only in books, in public meetings, in lectures, but also in plays. Hitherto, abortion has been allowed for medical reasons only, and women desiring to abort for other reasons apply for clandestine operations to professional abortionists, death being a common sequel. Owing to the danger incurred these abortionists charge highly. The mother herself, if denounced, is prosecuted also, and her life is often ruined. The Deutsche Ärztetag, notwithstanding those nuisances, has at one of its last meetings petitioned that artificial abortion, if not performed for medical reasons, should be punished by the forthcoming criminal law. On the other hand, the Berlin association of medical women urges that artificial abortion, if performed by a qualified medical man or woman for social reasons, should be legal. The Criminal Reform Bill is still in the stage of committee discussion in the Reichstag.

ALTITUDE AND HEART DISEASE.

In a paper read before the Berlin Medical Society on the influence of altitude on the circulation, Dr

Aron said that on theoretical grounds it had been thought wrong to send cases of heart disease and hyperpiesis to high altitudes. Nevertheless, patients of this kind often feel very well at high levels. They must, of course, be cautious and abstain from over-exertion, especially climbing. Moreover, those with poor compensation and with progressive arterio-sclerosis must not be sent there, since a certain reserve of cardiac strength is indispensable. Concerning the blood pressure, Dr. Aron said that some authorities have found an increase, some a decrease, and some no effect at all. The advantage of the mountain climate lies in the dryness of the air, which leads to a certain amount of desiccation of the body, and thus relieves the heart and kidneys. Hæmorrhage in the eye, the nose, and the lungs occurs at very high altitudes and under experimental conditions, but never at the heights at which the mountain health resorts are situated. It has been observed that patients with Graves's disease feel especially well in high altitudes, notwithstanding the disorders of cardiac function associated with that disease. Dr. Aron reported experiments made in a low pressure chamber where the pressure was reduced by a quarter of an atmosphere, being equal to an altitude of 2000 metres. His observations supported the opinions already set out.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

HOSPITALS AND SWEEPSTAKES.

AT the meeting of the Diocesan Synods of Dublin, Glendalough, and Kildare, held last week, the Archbishop of Dublin declared his intention of refusing his support, or the granting of any facilities as far as he personally was concerned, to the Dublin Hospital Sunday Fund, if it gave any grant to hospitals which availed themselves of the powers recently given by the Act permitting sweepstakes in aid of hospitals. The Fund, which is mainly made up of church offertories, has hitherto received considerable support from the churches of the diocese. It is to be feared that if the churches fail to support the Fund in which they have been interested they are likely to lose touch with the hospital charities altogether. The difficult problem of the hospitals is not likely to be helped by the Archbishop's intervention.

AN ACTION FOR DAMAGES.

In the High Court, Dublin, last week, before Mr. Justice Sullivan, a case was heard in which Mr. Patrick Moore claimed damages against Dr. Michael Walsh, of Dublin, for alleged negligence on May 6th, 1927, in certifying that the plaintiff was a dangerous lunatic. Without leaving the box, the jury found that there was no negligence, and judgment was entered for the defendant. It appeared from the evidence that in May, 1927, the plaintiff heard wireless messages warning him that he was pursued by assassins. He fled to Kingstown Harbour to seek the protection of a British warship and went on board the Irish light steamer *Irene*. He was there arrested by the police, and he attempted to escape by jumping out of a boat. The magistrate, before whom he was brought, ordered Dr. Walsh to examine him and report on his condition. Dr. Walsh certified him as a dangerous lunatic, and he was detained first in the Grangegorman Mental Hospital, and later, by order of the Chief Justice, in a private mental hospital at Glasnevin. The superintendents of these two institutions gave evidence that at the time the plaintiff was under their care he was suffering from delusional insanity. The same plaintiff had some months ago initiated proceedings against these two gentlemen, but the actions had been stayed by the courts as vexatious.

THE IRISH MEDICAL ASSOCIATION.

The annual meeting of the Irish Medical Association was held in Dublin on June 25th, with Mr. P. E. Hayden, the President, in the chair. The annual report showed that the membership of the Association on Dec. 31st, 1929, was 388. This was less by 21 than in the previous year.

THE LATE DR. HOUSTON.

Dr. John Carson Houston died in Belfast on June 27th after a short illness following operation for gall-stones. He was educated at the Royal Belfast Academical Institution and the Queen's University of Belfast where he won a reputation as a redoubtable Rugby football player. Qualifying in 1909 at the last examinations held by the Royal University of Ireland he took up house appointments at the Royal Victoria Hospital, and later at Belfast City Fever Hospital. During the war he served for several years in France with a commission in the Royal Army Medical Corps. Afterwards entering practice in the north end of Belfast he built up a large connexion, and his professional knowledge and sound judgment inspired confidence in his patients. Outside his work he was a keen geologist and had a remarkable knowledge of English poetry. Silent and reserved among strangers, among intimates he was full of quaint humour and mature thought. He occupied a high position in the esteem of his colleagues, and will be remembered as a kind and skilful physician and staunch friend. He died unmarried.

APPLIED PHYSICS.

ANNUAL INSPECTION OF THE NATIONAL PHYSICAL LABORATORY AT TEDDINGTON.

THE annual inspection of the National Physical Laboratory by the General Board took place last Friday, June 27th, when Sir Ernest Rutherford, chairman of the Board, and Sir Richard Glazebrook, chairman of the executive committee, welcomed more than a thousand visitors. During the afternoon various experiments and pieces of apparatus were on view, a total of over seven hundred exhibits, and choice was difficult. The fascination of delicate instruments of precision, the excitement of a train of experimental difficulties overcome by sheer ingenuity, the marvel of such large-scale working as was seen in the wind tunnels and in the colossal equipment of the high-voltage building, the simple delight of a ride along the water tank—all followed in rapid succession, as the visitor passed from building to building. The demonstrations may be divided into five overlapping groups.

In the section of *Standards* measures of all kinds were shown, from those of weight and distance to precision electrical resistances. These ranged up to 10,000 ohm, and were constructed of two materials of opposing temperature coefficients to make them independent of thermal variations. Methods for the

comparison of standards and for the estimation of characteristic coefficients included those for the determination of international standard freezing-points at high temperatures by means of a valve-controlled vacuum furnace and for the measurement of X ray intensities in terms of the new international unit. The methods used for the rating of instruments of common use, such as watches and clocks, thermometers, telescopes, and speedometers were also on view.

In the section of *Materials* the relationship between the macro-and micro-structure of cast alloys were demonstrated. The methods used for the manufacture and for the study of the constitution of alloys of iron-manganese and iron-chromium could be seen and also the electrolytic preparation of pure beryllium. The examination of the behaviour of mild steel under bending tests in various media with its application to the cracking of boiler plates, the investigation of the mechanism of "creep" in metals under prolonged loading at elevated temperatures, and the research on chains and hooks, all provided examples of the direct application of these studies. These applications were carried further into the fatigue tests on crystals of silver, antimony and zinc, corrosion fatigue tests in vacuo, and high speed fatigue tests on spring plates under reversals of bending strain. The examination of electrical insulating materials under high voltage tests, of X ray protective materials and their efficiency, and of leakage from radium tubes were to be seen in operation.

In the section of *Experimental Methods* were some recently devised laboratory tricks for special purposes. The shadow of smoke from titanium tetrachloride was thrown on a screen to render visible various types of fluid motion. Water was pumped through a glass tank past fixed obstacles of known shape, and the consequent eddies and main lines of flow were thus thrown into sharp relief. This is of use in determining the nature of the wake left behind moving bodies, whether in air or in water, and is being applied to problems of aeroplane design. A very pretty method of detecting flaws and surface cracks in metals, too fine to be otherwise seen, was demonstrated in the metallurgy building. A suspension of fine iron particles in paraffin is poured over the metal while this lies in a strong magnetic field; the intensification of the field in the neighbourhood of cracks and flaws leads to the local deposition of the particles which etch-in these defects in a remarkably clear way. The two shops for the construction of model aeroplane parts and of ships models respectively were full of delightful workmanship. The joinery and lathe work in the former were of a very high order, and in the latter the cutting of model hulls from wax and the making of model aluminium propellors, both carried out automatically to any predetermined form, attracted much attention.

In the section of *Machinery Testing* several pieces of work were being carried out for the Ministry of Transport. An experimental trailer for the determination of tractive resistance and wheel impact, vibration recorders, and remote recording accelerometers were to be seen, some of them in use. Elsewhere the testing of rear reflectors for bicycles and the brightness-difference-threshold meter for estimating glare had direct reference to road vehicle lighting. The acoustics of buildings came under examination in Bushy House. Here the application of sound-pulse photography, a three dimensional model of an auditorium and a ripple tank for the two dimensional investigation of acoustic reflections were to be seen. The lighting of buildings, in respect of the efficiency of light wells, was being investigated, and the ten-foot sphere for the examination of lighting fittings was shown. Outside the high voltage building a spectacular demonstration of flash-over tests on porcelain insulators under artificial rain was made; with a series of vast sparks and artificial thunder-claps it was shown that the effective value of these particular insulators was lowered by 10 per cent. in rain.

In the section of *Design* come the two pieces of large scale research into aeroplane and ship hull design. In the duplex wind tunnel a model was being used to determine the best position on an aeroplane wing for an engine nacelle; beneath the tunnel was shown a complete model aeroplane suspended from a series of electrical balances for the measurement of yawing and rolling movements. In the William Froude national tank a model of an ocean cargo boat which has been for some time working across the Atlantic was under test. It was propelled by its own screw, driven by an inboard motor of $\frac{1}{2}$–$\frac{3}{4}$ h.p., at a speed of eight knots along a 500-ft. tank, through a series of three-inch waves. This represented to scale the conditions met with in a North Atlantic crossing, and was used to determine the propellor efficiency and speed-keeping qualities of ships in rough weather. This tank has proved too short for tests of sufficient duration, and the plans of a proposed new tank lay-out with a length of 700 feet were shown.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

The following appointments are notified: Surg. Lt.-Comdrs. T. C. H. Neil to *Pembroke*, for R.N. Barracks, Chatham; W. Flynn to *Sutton*; J. F. H. Gaussen to R.N. Hospital, Portland; and T. Madill to H.M.H.S. *Maine*.

Surg. Lt. W. A. Hopkins to *Egmont*, for H.M. Dockyard, Malta.

ROYAL NAVAL VOLUNTEER RESERVE.

The following appointments are notified: Surg. Lt.-Comdr. T. W. Drummond to *Victory*; Proby. Surg. Lts. J. J. Dwyer and G. M. Tanner to *Victory*, for R.N. Hospital, Haslar; Proby. Surg. Sub-Lts. R. H. Berry and S. C. Suggit to *Victory*, for R.N. Hospital, Haslar.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. and Bt. Col. (temp. Col.) A. C. H. Gray relinquishes the appt. of Professor at the R.A. Med. Coll.

Lt.-Col. R. R. Lewis retires on retd. pay.

Maj. and Bt. Lt.-Col. (temp. Lt.-Col.) W. C. Smales to be Lt.-Col., vice Lt.-Col. R. R. Lewis.

Maj. T. T. H. Robinson to be temp. Lt.-Col.

Capt. C. V. Macnamara to be Maj. (prov.).

Capt. I. F. MacKenzie relinquishes his temp. commn.

ARMY DENTAL CORPS.

Capts. H. J. Higgins and A. B. H. Cole to be Majs.

TERRITORIAL ARMY.

Lt. W. Niven to be Capt.

J. C. McFarland (late Cadet, Liverpool Univ., Sen. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE.

D. S. Buchanan is granted a commission in the Special Reserve as a Flying Officer.

Flight Lt. G. R. Nodwell is transferred from Class D (ii) to Class D (i).

Flight Lt. W. D. McKeown relinquishes his short service commission on account of ill-health.

INDIAN MEDICAL SERVICE.

Lt.-Col. J. E. Clements retires.

The undermentioned appts. are made: Chuni Lal Ahluwalia, Gopal Singh, Hira Nand Dewan, Kundan Lal Malhoutra, Shiv Parshad Bhatia, and Promode Kumar Sen Gupta to be Lts. (T.C.).

THE NEW SURGICAL WING AT ST. BARTHOLOMEW'S HOSPITAL.

By E. Maxwell Fry, B. Arch., A.R.I.B.A.

The plan of the square of St. Bartholomew's Hospital with its four large eighteenth century buildings shutting it in, is probably familiar to most readers of The Lancet. It will, therefore, indicate the position of the new surgical block which is being opened to-day (Friday) by the Lord Mayor of London, to say that it is entered through the centre doorway of the south block, and that when the scheme of reconstruction of the hospital is completed it will consist of a surgical block, a medical block built over and into the south block itself, and a theatre block midway between. At present every operating case has to be taken across the open quadrangle to the existing theatre in all kinds of weather, so that the provision of the new surgical block removes at one blow one of the patent disabilities of the old unhappy arrangements.

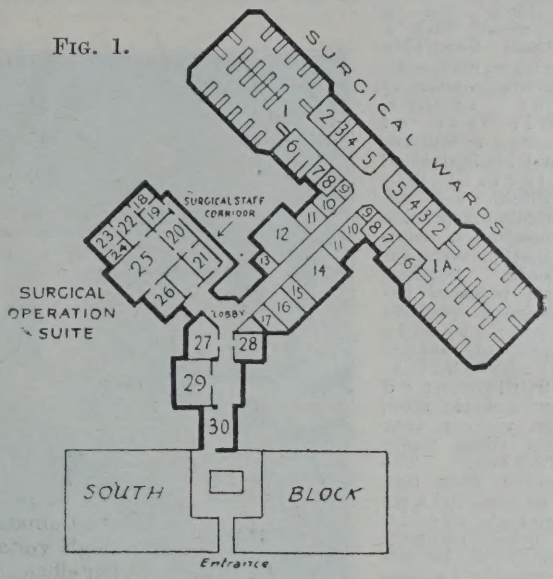
The plan of the new block is governed to a certain extent by the restricted nature of the site, which does not allow of ideal planning. Within these restrictions the architects, Messrs. Lanchester and Lodge, have planned to the utmost limits of enlightened hospital practice, introducing features which even more ideally situated hospitals are without and producing what must be accounted the most scientifically constructed hospital block in the world.

The surgical block is connected on the one side with the nurses' home and on the other with the out-patients and casualty wards, ensuring thereby two essential arterial supplies. With this block running east and west and the south block irremediably fixed in its present position, it will be seen that the theatre block, which should be removed from the wards as an independent unit, is so placed as to lie adjoining the connecting corridor flow, with its large theatre windows facing the steady north light.

Fig. 1 shows the arrangement of one typical floor. There are five of these one above the other, with another floor of laboratories above, and on the roofs a solarium. In the basement will be found the machinery which keeps the services of all kinds in motion, while there is yet another operating theatre for X ray work only.

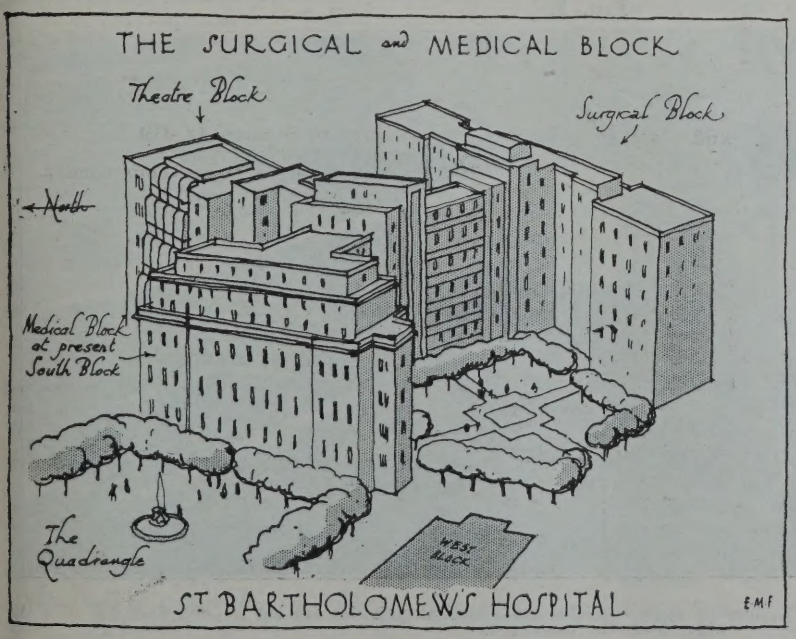
Fig. 2 shows in rough sketch form the appearance of the completed block, and shows why it is necessary to plan a modern hospital not in large single blocks, but in widely deployed wings, cutting in and out as its intention varies, and most important, allowing sun and air to stream uninterruptedly through as many windows as possible. In this connexion it should be remarked that the simple fact of the temperature on one side of a building being slightly lower than on the other is enough to induce cross ventilation without the presence of wind. This natural ventilation is here used to its utmost.

Fig. 1.



(1) Men's ward. (1A) Women's ward. (2) Kitchens. (3) Bath-rooms. (4) One-bed wards. (5) Two-bed wards. (6) Clean "wash-up" rooms. (7) Dirty "wash-up" rooms. (8) Pathological rooms. (9) Patients' clothes rooms. (10) Linen rooms. (11) Sisters' rooms. (12) Special examination and pathological room. (13) Surgeons' laboratory. (14) Bed and main lift. (15) Women's lavatory. (16) Patient's friends waiting room. (17) Men's lavatory. (18) Instrument room. (19) Nurses' dressing room. (20) Surgeons' dressing room. (21) Dressers' and house surgeons' dressing room. (22) Sterilising room. (23) Staircase. (24) Students' observation gallery. (25) Major operation theatre. (26) Anæsthetising room. (27) Visitors' temporary canteen. (28) Temporary dormitory for patients' male friends. (29) Temporary dormitory for patients' female friends. (30) Temporary connecting corridor.

Fig. 2.



The Wards.

The wards, each of 22 beds, supplemented by three beds in two small private wards, are on a sort of dumb-bell plan (Fig. 3) with the service rooms on the connecting corridor duplicated for each ward, male and female. In the wards themselves one is surprised at the absence of the institutional atmosphere. What was chilling in the old hospital plan has been eliminated. The ward is wide instead of long and has a central partition which allows of a regular but not monotonous disposition of beds. Heating is on the panel system and no pipes are visible, but there are two large gas stoves

on the end wall of the wards as a concession to that desire for radiant heat that will keep breaking through our zeal for scientific heating. Open fires might have done even more to promote the feeling of comfort, but they demand extra service.

Each bed is equipped with a care for the physical and mental comfort of the occupant. Wireless, of course, is laid on, and an individual electric light switch, an all-enveloping private curtain, a combination stool for books, brushes, and personal belongings provide sympathetic units of bedside organisation, supplemented by a little stool for visitors that just slides under the bed. The power plug and suction plant point are in another category that will be described later. The glass-faced poison cupboard is the only cupboard in the ward.

FIG. 3.

One of the new wards (the Waring Ward).

THE WARD SERVICES.

The corridor that joins ward to ward carries a complete local service. On one side are, in order, kitchen, bathroom, one-bed and two-bed wards; on the other, clean and dirty "wash-ups," a room for pathological investigations, a patient's clothes room with lockers, and a linen room. The kitchen and clean "wash-up" lead directly from the wards, the remainder opening from the corridor. The small kitchen has an electric refrigerator beside a gas stove of unusual design, including boiling and heating ovens with a little gas stove for cheer. The bath in the bathroom stands free, so that it may be entered from either side. In the dirty "wash-up" are found the controls of the "suction" plant referred to in the description of the ward. This humane and ingenious device replaces the clumsy swabbing and clearing of wounds by a small suction nozzle that does the same work with greater ease and rapidity, carrying the pus and blood away from the bedside at once. The instrument has also other uses for the visiting surgeon.

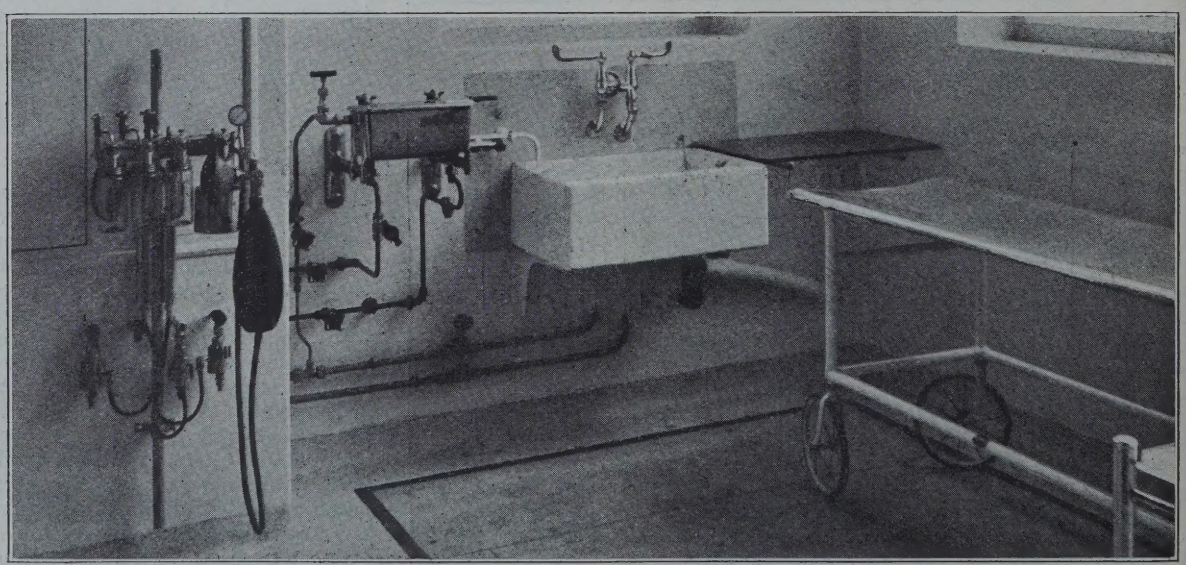
It might be well here to describe the system of one-way lifts that ensure that dirty dressings go down without coming in contact with clean dressings, which come up by another route. In the dirty "wash-ups" bed-pans are stacked on a coil of hot pipes so as to be warmed ready for use if required.

A corridor leading at right angles from the surgical ward block joins the entrance lobby to the theatre block before proceeding to the proposed medical block (as yet unbuilt). On this corridor is found the sisters' room, rather too close to the dirty "wash-up," though this is perhaps unavoidable. On the same side is the main staircase and lift-well, well-equipped rest rooms for visitors waiting to see friends, and lavatories. On the opposite side is the special examination and pathological room, equipped for certain laboratory work and classes.

The Theatre Block.

The design of modern operating-theatre units is a process of exact thinking and stringent elimination of non-essentials. If it achieves beauty it does so because elimination produces simple surfaces, new textures, and abundance of light. In this it moves with the trend of modern design. This theatre block is the most advanced of its kind. The intention

FIG. 5.



A corner of an anæsthetising room, showing apparatus through which anæsthetics are led to each floor by pipes from the basement.

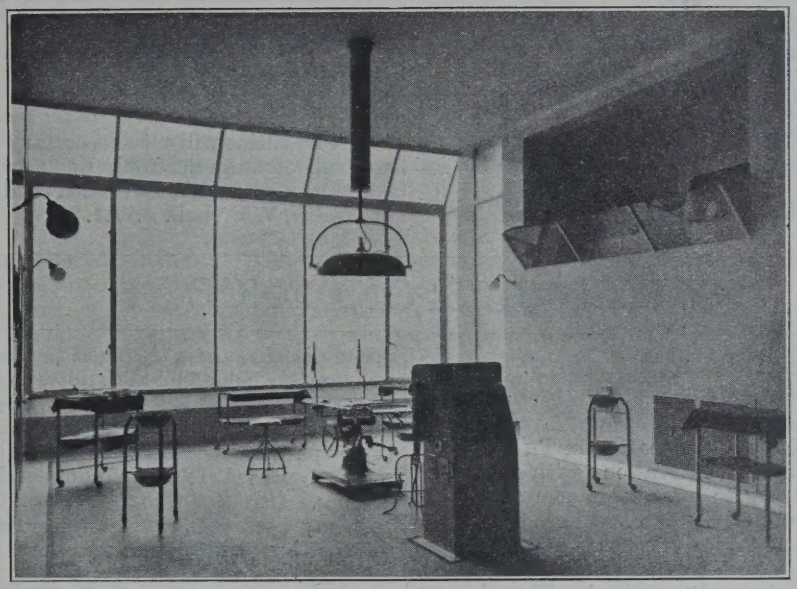
is to bring into the operating theatre only surgeons and nurses who are already washed-up, instruments which are already sterile, and a patient already prepared for operation. Provision is made that incoming and outgoing cases do not meet, and that students may view the operations without setting foot in the theatre.

The whole plan is thus a system of circulation leading to and from the theatre. To achieve this the nearest approach to the theatre is by way of the anæsthetising room (Fig. 5), whence the patient enters. The nurses and surgeons take a longer way round, entering the theatre by a little passage that serves first the dressers and house surgeons' dressing-room, then the surgeons' dressing-room, and finally the nurses' dressing-room, through which is reached the sterilising room. Each party to the operation is thus enabled to change and prepare for the work before reaching the theatre, without loss of time. The circulation is completed by a separate exit for patients.

In one corner is a staircase leading to the spectators' gallery, with a one-way opening door leading from the sterilising room.

The photograph (Fig. 4) of the theatre shows clearly the great north-light window, the operating-table, and anæsthetics column, supplied with a complement of four anæsthetic supplies, beside other equipment. To the right is the gallery for students with glass shield.

FIG. 4.



One of the theatres, showing screened gallery for students, and in foreground, an anæsthetics column which contains also controls and plugs for all electrical apparatus.

FITTINGS, FINISHES, AND MATERIALS.

The washing sinks, constructed with concave walls so as to minimise splashing, with cantilever brackets leaving clear space under them; and "elbow" taps in chromium-plated metal, are models of sane sanitation. A warning light replaces the bell signal here as elsewhere. These signal lights are a feature both of the wards, where they are used to warn particular surgeons of calls in other parts of the building, and of the corridors, where they are fixed over the doors of the small wards to which they are connected. Metal windows are used. The ward windows are large, open at a touch, and open to their full extent. They will also open at the top only for a minimum ventilation.

Hard cements and hard enamels are used in the internal work. In the wards and corridors light entering through the windows is reflected again and again from glossy surfaces until it performs five times its normal function.

The use of materials—not always new, but new in their application—produces a style of architecture where light engenders an atmosphere in which it should be a joy to work, and less of a burden to cure.

Bart.'s is being rebuilt essentially in the atmosphere of our time at one with the architecture of the tubes, of great liners, of aeroplanes, and of all modern works which are stamped with the avid, logical subjugation of matter by reason.

It must have become increasingly evident to the governors that nothing short of a reconstruction of the entire mechanism of the structure would restore the balance of part with part so as to allow the varied work to flow smoothly in and about the whole, and the new surgical block which is but part of a larger block, about which the reconstruction of the hospital is to be grouped. Many of the older blocks are to remain very much as they are; others are to be reorganised internally, while some others again will be demolished and their sites filled with new buildings.

BRITISH POST-GRADUATE HOSPITAL AND MEDICAL SCHOOL.

THE Minister of Health, Mr. Arthur Greenwood, has appointed a Provisional Organisation Committee for the new British Post-graduate Hospital and Medical School.[1] The committee is to report upon (1) the action requisite to lead up to the planning and construction of the medical school, and (2) the form of government appropriate to the hospital and medical school, with special reference to the position of the London County Council as the local authority responsible for the hospital, and to the position of the University of London in relation to the Medical School.

The Chairman is Viscount Chelmsford; the Ministry of Health will be represented by Sir George Newman, Chief Medical Officer, and Mr. Heseltine, as assistant secretary; and the London County Council will be represented by Miss F. Barrie Lambert, M.B., Sir William Ray, Mr. Angus N. Scott, and Mr. L. Silkin.

The representatives of London University will be the Rev. J. Scott Lidgett, the Vice-Chancellor-elect; Mr. S. L. Loney, the Chairman of Convocation and Deputy Chairman of the Court; Mr. H. L. Eason, Superintendent and Senior Ophthalmic Surgeon, Guy's Hospital; and Mr. Edwin Deller, the Principal.

The other members of the Committee are:—

Mr. Donald J. Armour, Senior Surgeon, West London Hospital.

[1] See THE LANCET, 1930, i., 869 and 881.

Lady Barrett, M.S., Dean of the London (Royal Free Hospital) School of Medicine for Women.

Mr. Comyns Berkeley, Surgeon, Middlesex Hospital, and a member of the Radium Commission.

Sir Robert Bolam, Honorary Physician, Royal Victoria Infirmary, Newcastle-on-Tyne, and past Chairman of Council, British Medical Association.

Dr. H. B. Brackenbury, Chairman of Council, British Medical Association.

Mr. H. W. Carson, Senior Surgeon, Prince of Wales's General Hospital, Tottenham.

Dr. H. G. Dain, Chairman of Insurance Acts Committee, British Medical Association.

Lord Dawson, Physician in Ordinary to the King, and Physician, London Hospital.

Prof. H. R. Dean, Professor of Pathology, Cambridge University.

Sir Walter M. Fletcher, F.R.S., Secretary of the Medical Research Council.

Prof. G. E. Gask, Professor of Surgery, London University, and a member of the Radium Commission.

Sir Thomas Horder, Physician in Ordinary to the Prince of Wales, and Physician, St. Bartholomew's Hospital.

Dr. F. N. Kay Menzies, Medical Officer of Health for the County of London.

Lord Moynihan, President of the Royal College of Surgeons; Consulting Surgeon, Leeds General Infirmary, and Emeritus Professor of Surgery, Leeds University.

Mr. H. J. Paterson, Senior Surgeon, London Temperance Hospital, and Honorary Secretary, Fellowship of Medicine and Post-Graduate Association.

Dr. Harold Pritchard, Physician, West London Hospital.

Sir Holburt J. Waring, Surgeon, St. Bartholomew's Hospital.

Mr. Heseltine will act as secretary of the committee, and all communications on the business of the committee should be addressed to him at the Ministry of Health, Whitehall, S.W.1.

CORRESPONDENCE

AVERTIN IN LARYNGOLOGY.

To the Editor of THE LANCET.

SIR,—In the report of the Section of Laryngology, Royal Society of Medicine, appearing in THE LANCET of June 28th, there are observations with regard to avertin on which I beg to offer some comment. It was stated, for example, by one speaker, that "the state of unconsciousness for two hours and sleepiness for three days was, especially in laryngeal conditions, something strenuously to be avoided. The absence of laryngeal reaction in these patients after the use of avertin was very alarming." These remarks were called forth and no doubt justified by the preceding statements of others which unfortunately are not recorded, but I would like to point out that those observations do not apply to the usual effects of avertin when correctly used. When so employed it has never to my knowledge caused sleepiness for three days, and what is more important, the laryngeal reactions return, if they are ever abolished, within a short space of time. This is secured by giving avertin without any preceding opiate or similar drug. I think it would be a pity if the use of avertin, which I have seen to be of enormous benefit to suitable patients undergoing operations on the throat, were to be avoided because of a fear which is really not well founded. I am, Sir, yours faithfully,

London, June 30th, 1930. J. BLOMFIELD.

COLOUR VISION TESTS.

To the Editor of THE LANCET.

SIR,—In an annotation on p. 1360 (June 21st) you dealt with the international standardisation of colour vision tests. The two essentials of a practical test for colour-blindness are that dangerously colour-blind persons only should be rejected by it and that no dangerously colour-blind person should escape detection. The wool test with five test colours allows 50 per cent. of dangerously colour-blind to escape detection and of those rejected by it 50 per cent. are practically normal-sighted. The pseudo-isochromatic tests in common use are those of Stilling, Ishihara, and my card test. In order to ascertain the relative merits of these three tests, 38 consecutive, referred or appeal cases were examined at the Board of Trade with the following results. None of these cases was examined by me alone; at least three persons and often more were present at all the examinations. In every case Capt. Ellery or Capt. Dowdy and the recorder were present. Each candidate was first examined by the pseudo-isochromatic tests and the fact whether he was dangerously colour-blind or not was ascertained subsequently. Ten of the 38 cases were passed and 28 rejected. Of the 28 who were failed 16 failed with all three pseudo-isochromatic tests, but 12 of those rejected passed Ishihara completely and 11 passed Stilling. Of those who were passed 7 showed defects with my card test, and of those who failed all were rejected by my card test, in most cases failing very badly, as for instance not reading card 8, a yellow-green C on an orange ground. The explanation of the difference is that a test for a dichromic will not necessarily detect a trichromic who has three colour sensations red, green, and violet but no yellow sensation, and who is obviously dangerous as shown by the examination with the lantern and spectral tests. In my card test also the pattern is the same on every card, so that the examinee has to judge by colour alone and cannot follow the design of the artist.

An important point to note is that a test which is difficult to the normal-sighted is not necessarily difficult to the colour-blind. This is shown by the number of colour-blind persons who can read Stilling's plates numbered 9 and 10, the reading of which is supposed to indicate very good colour perception. In fact, a test may be constructed which can be read by the colour-blind but not by the normal-sighted. Nagel's anomaloscope is not a satisfactory test as a man may be anomalous without being colour-blind and 90 per cent. of the colour-blind agree with the normal equation.

I am, Sir, yours faithfully,

F. W. EDRIDGE-GREEN.

Board of Trade, S.W., June 28th, 1930.

SUSCEPTIBILITY TO HAY-FEVER.

To the Editor of THE LANCET.

SIR,—There is some evidence that susceptibility to hay-fever is hereditary. It is also a character usually well marked and comparatively easy to trace amongst members of a family. At this time of the year many general practitioners must meet with hay-fever cases whose genetical history could be discovered without much difficulty. Should any of your readers come across such cases and be willing to obtain records of the incidence of hay-fever amongst members of the family over (say) four generations, I should be glad to receive them as I am collecting records of this kind.

I am, Sir, yours faithfully,

H. G. THORNTON.

Bacteriology Department, Rothamsted Experimental Station, Harpenden, June 27th, 1930.

NOISE IN HARLEY STREET.

To the Editor of THE LANCET.

SIR,—As a fellow sufferer I should like to endorse Mr. Ralph Thompson's protest against the persistent din—"noise" is too mild a word—which has afflicted us in this neighbourhood for several weeks past. From the slowness with which the work of building the London Clinic proceeds it is to be feared that we may be subjected to this nuisance for a long time yet. There are noises which are endurable and there are noises which are not. But for this fact I should not write to you, since we cannot expect even a building having so beneficent an intent as a nursing home to be erected like the Jewish temple—noiselessly. The noise that is intolerable is the riveting of the steel girders—sudden, piercing, echoing, and altogether devastating. Friends with knowledge of architecture and building tell me that this exasperating noise could be avoided by the use of special drills, though this would involve an extra expenditure in the cost of the nursing home. May we venture to hope that those concerned will consider it a good investment to incur this additional outlay in exchange for our sympathetic support in the future? I am, Sir, yours faithfully,

Harley-street, W., July 1st, 1930. THOMAS HORDER.

To the Editor of THE LANCET.

SIR,—Could I be allowed to join in with the protest against the hideous noise at the north end of Harley-street? Apart from the almost impossibility of using any sort of instrument or telephone, the constant din is most bewildering and quite inhibits any concentration. I am, Sir, yours faithfully,

Harley-street, June 28th. HORACE HILL, M.R.C.P.

A MANUAL OF FEVERS IN INDIA.

To the Editor of THE LANCET.

SIR,—In your issue of April 26th (p. 939) appeared a letter from Dr. P. T. Patel about the review of his book on infectious diseases (THE LANCET, Jan. 25th, p. 192). Your views, I may say, are shared by most public health authorities out here. Dr. Patel's fear of the introduction of yellow fever is out of date. The old, old bogy about the Panama Canal was drummed into us 20 years ago, and the risk of infection through the Canal Zone is remote in comparison with that of cases imported from Africa to India. Though the risk of yellow fever coming to India along the Imperial Airways route cannot be altogether excluded, Karachi and not Bombay would be the first to get infected.

I am, Sir, yours faithfully,

June 6th, 1930. INDO-MEDICUS.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

COLONIAL HEALTH SERVICES.

ON Thursday, June 26th, the House went into Committee of Supply on the Civil Estimates. Mr. DUNNICO, Deputy Chairman of Committees, was in the chair.

On a vote of £98,306 for the salaries and expenses of the Department of the Secretary of State for the Colonies,

Miss PICTON-TURBERVILL called attention to the question of mui-tsai in the Crown Colony of Hong-Kong, a system under which, she said, little girls from 7 and 8 years of age upwards were deliberately sold for certain sums of money. Such a system, she urged, ought not to exist any longer under the British flag. The hon. Member also drew attention to the practice in the same Colony of selling young girls in connexion with the system of tolerated houses. One way of dealing with this question was to abolish tolerated houses, and she wished to know whether the matter was to be raised at the forthcoming Imperial Conference.

EDUCATION AND MEDICINE.

Mr. HORRABIN raised the question of education in the African Colonies. He said that he wished to emphasise the very strong appeal made recently for the closer relationship between the medical service and the educational machine. It had been remarked that the Board of Education in this country had become more and more a Ministry of Health through the medical examination of children in the schools. That ought to be the case in Africa, where questions of health, hygiene, and sanitation were so much more important. Out of every 1000 babies born in almost every tribe in Kenya, rather more than 400 died every year. He believed that that was a very low estimate.

Miss RATHBONE said that it was hard to see how the requisite changes in administration could be carried out in Africa if the expenditure upon natives was to be bounded and limited by the amount of taxation collected from the natives. Money in matters of social reform was the root of all progress. Indeed, the amount of progress that could be accomplished in health and in education would be the measure of the financial resources available for the purpose. From many workers who had spent years in doing painstaking work for the education and health services of women in Africa she had heard complaints of tiny grants capriciously given, frequently lowered or withdrawn without any particular reason, often in accordance with the demands of economy or because of some anonymous complaint or because money must be made available for some institution in which an administrator was interested. On the health side one heard of great tracts of Africa where hospitals were either non-existent or where they had no female staff, being staffed entirely by men and native boys. This state of things existed although there was an appallingly high infantile and maternal mortality.

Mr. ERNEST WINTERTON said that in 1888 the House of Commons passed a resolution cordially supporting the Imperial and Colonial Governments in their endeavour to suppress the traffic in spirituous liquors in the territories under their influence and control. There had been an increasing sale of spirits in certain parts of the Crown Colonies, which was causing the gravest distress and concern to many people in this country, whether they were associated with the temperance cause or not. They were filled with grave concern at the unsatisfactory nature of the replies so far given, and although they acknowledged that there had been some slight improvement in West Africa and on the Gold Coast during the last two years, there was still much to be done to redeem the established declaration of the House of Commons that the right thing to do was to prohibit the liquor traffic as regarded the native races.

AFRICAN WOMEN.

Dr. DRUMMOND SHIELS (Parliamentary Secretary for the Colonies), replying to the debate, said that the position of women in Africa, maternity and child-welfare, and so on, was the subject of earnest consideration by the Colonial Office, and the existence

of the Colonial Development Fund had given them some encouragement. The terms of reference of the Fund were broadly drawn, and it had been found possible to include in the schemes towards which assistance could be given schemes to develop and assist public health services. A Committee of the Colonial Office had just been sitting to devise the lines along which such assistance should be given, and he was certain that before long they would get very substantial assistance from this Fund for various Colonies which were not very well off. There was no doubt that they had been hampered, especially in certain Colonies, such as Nyassaland, because of the parsimony of the Treasury. But they were now hopeful that in Nyassaland and other parts they might be able with the help of the Colonial Development Fund, not only to assist in public health, but also in the training of subordinate medical personnel, and of midwives, and in other ways to meet the very real need to which hon. Members had called attention. Referring to the question of mui-tsai in Hong-Kong, Dr. Shiels said that last December new regulations were put into force for the registration of employers, and six months were given for the change to be brought about. In July they expected to find out the result of the alteration. It must be remembered that the task of dealing with this question was very difficult. Hong-Kong was a typically Chinese town, in very close association with the mainland, and it was difficult to carry out many of these regulations which were regarded as desirable, but no more mui-tsai were allowed to be brought in, and every effort was being made to carry out the decision which had been made. At the same time there was a difference of opinion, even among British people, as to whether all the results which had been expected from the abolition of mui-tsai would be realised. There was no doubt that there were some disadvantages in the girls being reduced to the status of domestic servants without the protection which they had under the present system. However, it had been agreed that in spite of these disadvantages an effort should be made to get rid of the system. The Chinese authorities had seriously meant to put a stop to the practice of mui-tsai throughout China, but the disturbed state of the country had made those efforts largely ineffective. The policy of the Government was to get rid altogether of the tolerated houses in Hong-Kong.

The debate on the vote was adjourned.

HOUSING AND SLUM CLEARANCE.

ON Monday, June 30th, the House went into Committee of Supply on the Civil Estimates, Mr. R. YOUNG, chairman of committees, in the chair.

On a vote of £12,724,200 for the salaries and expenses of the Ministry of Health,

LACK OF STATE ASSISTANCE

Sir KINGSLEY WOOD moved to reduce the vote by £100. He said that since they had been in office the Labour Government had succeeded in depriving thousands of families in England and Wales of new houses which might have been in existence to-day. There had not been even sufficient State-assisted houses built to meet the ordinary growth of the population and to replace the wastage of old buildings, and if it had not been for private enterprise the housing shortage in the past year would not have been reduced. An army of over 100,000 building operatives walked the streets looking for work in building houses which in many quarters were badly needed, rents had not been reduced, the slums still remained, and the replanning of town and country had made no adequate advance. This was due to the weak, hesitating, and doubtful policy of the Minister of Health.

Mr. E. D. SIMON said that the Ministry of Health was such an overgrown organisation that no Minister could be expected to have very much time to think about these pressing problems. But housing was by far the most important task which the right hon. gentleman had to face, and he believed that it had been very seriously neglected in recent months. He believed that Members in all parts of the House would support the Government in taking some measures to get back from the miserable figure of 50,000 to something approaching the goal they had set before them of 225,000 assisted houses a year.

Miss LEE appealed to the Minister to tackle the problem of rent. She knew that the Government were trying to do it in the Slum Clearance Bill, but there was also the problem of the rents of houses already built. It was no use going on building more houses at rentals which people could not afford to pay.

PROVISION OF THE CHEAP HOUSE.

Sir TUDOR WALTERS said he thought that the real reason why house-building was slackening off was that of the kind of house they had been laying themselves out to build in the last few years—namely, houses of the standard of the Tudor Walters Report, the supply had almost reached the demand. The question of supreme importance now was the provision of the cheap house, the housing of the slum dwellers, the casual workers, and the poorly paid members of the community. But if cheap houses were to be built they must be good houses, and not insanitary huts or hovels, or houses which would degenerate into slums. Such houses must be built on a large scale and they must organise and control the method of building and the supply of materials, and take care that there was no exploitation. They must survey the housing requirements of the whole country and include in their purview slum clearance, the provision of cheap houses to replace slums, and the provision of rural houses at rents which the rural workers could pay. There should be a National Housing Board with four or five men on it who understood the question and would insist upon something being done.

Dr. DAVIES said that of all the failures of the Government the most colossal was their failure in regard to housing. They had expected better results from Mr. Greenwood, who was no novice in this matter, having served as Parliamentary Secretary under the late Mr. Wheatley when he was Minister of Health. But after 12 months of office of the present Government the country was faced with a shocking state of affairs. Why had the Minister of Health not asked Mr. Thomas, when he was Lord Privy Seal, to devote some of the money voted by the House for the relief of unemployment, to assist in the progress of housing? One of the great difficulties which faced local authorities at the present time in regard to housing development was that they were not prepared to take upon themselves fresh financial responsibilities.

MINISTERIAL REPLY.

After further debate,

Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that by every test it was possible to apply it could be proved that this year was much better than last year as far as housing results were concerned. The total number of houses built by local authorities was up, and so was the number built by private enterprise. The total number of houses built between March, 1928, and March, 1929, was 169,532, and no fewer than 201,812 houses had been built this year—i.e., up to March last. As a matter of administration the Government had advised local authorities to hold their hands for slum clearance until the new Housing Bill had passed through the House. They had done so because the authorities under the new procedure would be safer, secondly because the procedure would be quicker, and thirdly because the authorities would be receiving more money. Those were good and sound reasons.

The motion to reduce the vote was negatived by 229 votes to 148.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 25TH.

Fatal Street Accidents in London.

Mr. DAY asked the Minister of Transport whether, in view of the increase in the number of fatal accidents in London during the previous 12 months, what action his department or the London Traffic Advisory Committee were taking to prevent the increase of such accidents in the future; and if he had received any recent reports from the London Traffic Advisory Committee on the subject.—Mr. H. MORRISON replied: My Department, as well as the London Traffic Advisory Committee, are continuously engaged on the consideration of proposals designed to improve the conditions of the streets in London from the point of view of safety, and I am always prepared to consider any such proposals which may be submitted by the local authorities. Two reports of the committee were issued last year on this subject, and were discussed with representatives of all local authorities in the area, and with the associations and societies interested. I hope to be in a position to publish the conclusions reached at the conference at an early date.

Hospital Charges to Air Personnel in Iraq.

Sir GEORGE BOWYER asked the Under Secretary of State for Air whether he was aware that members of the Royal Air Force in Iraq, while in hospital, were deprived of their Colonial allowance, and had to pay 2*s*. 6*d*. a day as a hospital charge, thus undergoing a total loss of 11*s*. 6*d*. a day; and whether he would see that this Colonial allowance was restarted forthwith.—Mr. MONTAGUE replied: My noble friend is aware of the facts stated by the hon. and gallant Member, but he does not see his way to alter the regulations upon this subject. The charge of 2*s*. 6*d*. a day is the normal hospital stoppage for officers, and the issue of Colonial allowance is also properly suspended since it is not an ordinary emolument but an additional allowance granted solely to meet the extra cost of living in a command abroad as compared with the cost at home. When an officer is in hospital and is not subject to the additional expenses which the allowance is intended to cover, its continued issue is clearly not justified.

Sir G. BOWYER: Will the hon. gentleman call for a report on this matter from Iraq, and thus learn of the great difficulties and distress of feeling which there is in that country upon this subject at this time?

Mr. MONTAGUE: I would point out that there is no marriage rate in Iraq at all. The marriage state is not recognised in that respect there.

Cream Regulations in Scotland.

Dr. HUNTER asked the Secretary of State for Scotland if he had made any decision in connexion with the request from a deputation representing the creamery proprietors and wholesale dairymen throughout the country to rescind or amend the Cream Preservative Order.—Mr. JOHNSTON replied: After careful consideration of all the medical and other evidence available and after consultation with my right hon. friend, the Minister of Health, the Secretary of State regrets that he cannot see his way to authorise the withdrawal or amendment of the provisions of the Preservatives Regulations relating to cream.

Mosquitoes and Public Health.

Sir WILLIAM DAVISON asked the Minister of Health whether his attention had been called to the continued increase in the number of mosquitoes in this country; and what action was being taken to combat this menace to the national health.—Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend is advised that the number of mosquitoes in this country fluctuates from year to year, according to the climatic conditions, but does not show any general increase. In the present year some species (especially the sylvan species) are unusually prevalent. My Department, in collaboration with the British Museum (Natural History), has given attention to this matter for some years past, and a pamphlet on British Mosquitoes and their Control has been published, which contains advice on the best methods of combating mosquito pests. My Department is also prepared on request to advise local authorities on the matter.

THURSDAY, JUNE 26TH.

Medico-Psychological Departmental Hospitals.

Mr. OLIVER BALDWIN asked the Minister of Health if he would consider the setting up of a medico-psychological department to mental asylums, both criminal and non-criminal, in order to attempt the effecting of cures.—Mr. GREENWOOD replied: I cannot undertake to consider this suggestion without a more precise indication of the constitution and functions of the proposed department, and of the necessity for its establishment, having regard to the medical services already available in mental hospitals. I would remind my hon. friend that criminal lunatic asylums are within the jurisdiction of the Home Secretary, and any question in regard to them should be addressed to him.

Smoke Abatement.

Sir NICHOLAS GRATTON-DOYLE asked the Minister of Health what number of local authorities had adopted by-laws on the subject of smoke abatement; what number had no by-laws; and whether it was proposed to take any steps to extend the adoption of such by-laws.—Mr. GREENWOOD replied: 116 local authorities have made by-laws. Although this leaves 1652 without by-laws, the districts without by-laws are largely those where few or no manufacturing processes are found, and many of them are rural. In view of this, and of the powers of proceeding for proved nuisance even without by-laws, I do not think it necessary at present to exercise the power given me by the Act of 1926 of forcing local authorities to make by-laws.

Sir N. GRATTAN-DOYLE: Will the right hon. gentleman bear in mind that this question of smoke abatement is of very vital interest to the public health, and will he not try to ginger up the local authorities so that they will do a little more than they have done?

Mr. GREENWOOD: I am very anxious to encourage local authorities but the process of gingering up is one to which there is a limit.

Midwives Administration.

Capt. EDEN asked the Minister of Health his reasons for refusing to make an order under Section 62 of the Local Government Act, 1929, directing that the borough council of Leamington should become the local supervising authority for the district under the Midwives Acts, 1902 to 1926.—Mr. GREENWOOD replied: I have already informed the borough council that I do not consider it desirable that a separate organisation should be set up for the supervision of midwives in an area in which the number of practising midwives is so small as in this case.

Capt. EDEN: Is the right hon. gentleman aware that this decision is strongly resented by the local authority, and will he indicate the place in the Act where he finds the words on which he has based his decision?

Mr. GREENWOOD: I have not the Act by me, but it was clearly contemplated by the late Government that the powers should only be used in an area where there were a sufficient number of midwives to justify a separate organisation.

Sir KINGSLEY WOOD: I take it that the right hon. gentleman is willing to follow the late Government?

Mr. GREENWOOD: I would not say that, but I must administer the law as it stands.

Capt. EDEN: Does the right hon. gentleman suggest that the local authority is not capable of exercising these powers, and since these words do not occur in the Act, will he reconsider his decision?

Mr. GREENWOOD: As a matter of fact it really is a question of local efficiency, and where the number of midwives in an area is very small, it is clearly advantageous that the administration of the Act should be in the hands of the larger authority.

Defective Children.

Mr. FOOT asked the President of the Board of Education the number of children in England and Wales under the age of 14 for whom, owing to their blindness or other physical disability, no educational provision was at present being made.—Sir C. TREVELYAN replied: The returns furnished by local authorities show that on Dec. 31st, 1929, the number of blind children in England and Wales, under the age of 16, not attending any school or institution was 557; that the corresponding number of deaf children was 305; and of cripples 5461. The returns do not show how many of these children were under the age of 14. It must not be inferred that there is a need for further special school provision to the extent indicated by these figures, as they include some children under the age of compulsory school attendance, and some children prevented by temporary difficulties from attending special schools.

Mr. FOOT: Is the right hon. gentleman satisfied that the number of these children deprived of education is being satisfactorily reduced year by year?

Sir C. TREVELYAN: I am satisfied that the position is getting better, and that there is no special need for increased accommodation.

Private Asylums.

Mr. MACLEAN asked the Minister of Health whether any conditions were imposed upon the licensee of a private asylum as to the conditions under which patients were kept, and the financial charges made while in the keeping of such asylums; and whether he proposed to take power to compel the licensees to submit their accounts to a Government Department for examination.—Mr. GREENWOOD replied: The conditions under which patients are treated in private

institutions are examined by the Visiting Commissioners of the Board of Control who have a duty to inquire among other things as to the fees paid. The Commissioners satisfy themselves that the fees paid are generally reasonable for the accommodation and treatment supplied. The answer to the last part of the question is in the negative.

Bathing Accidents in the Serpentine.

Sir NAIRNE STEWART SANDEMAN asked the First Commissioner of Works whether, in view of the accidents which had occurred recently to bathers in the Serpentine, he would provide a larger measure of supervision than hitherto.

Mr. DAY asked the First Commissioner of Works whether any additional police had been detailed for duty during the mixed bathing sessions on the Serpentine, Hyde Park.—Mr. LANSBURY replied: Police duties in the Park have been rearranged so as to enable two additional male officers to be on duty at the bathing place in the morning, and two in the evening with a policewoman. As to supervision generally, I am satisfied that the present arrangements are quite adequate.

Insanitary Houses in Paddington.

Miss RATHBONE asked the hon. Member representing the Ecclesiastical Commissioners whether his attention had been drawn to the conditions of insanitation and overcrowding, as revealed by the reports of the medical officer of the borough of Paddington, in certain properties in that borough owned by the Ecclesiastical Commissioners; and whether the Commissioners were taking any steps to put their property into the same condition of repair as some other properties under their direct control.—Mr. MIDDLETON replied: The Ecclesiastical Commissioners have not been notified of any report of the medical officer of the borough of Paddington. If they receive notification they will carefully consider what obligations may be imposed upon them by the facts disclosed.

MONDAY, JUNE 30TH.

Lunacy and Divorce.

Mr. HOLFORD KNIGHT asked the Prime Minister whether he had received a memorial, signed by 70 Members of the House of Commons, praying for facilities for the Bill to make certified lunacy of five years and upwards a ground for divorce; whether he was aware that there was a national demand for this reform in the divorce law; and whether he could see his way to grant facilities for the further stages of this one-clause Bill.—Mr. MACDONALD replied: Yes, Sir. As I have already informed my hon. friend by letter, in the present state of Parliamentary business I regret that it is not possible to grant facilities for the Bill referred to.

TUESDAY, JULY 1ST.

Miners and Nystagmus.

Miss LEE asked the Secretary for Mines if he was aware of the inadequate provision made for miners suffering from nystagmus; what steps had been taken since June, 1929, to improve their position; and what measures, if any, were at present under consideration by his department.—Mr. E. SHINWELL replied: Miners suffering from nystagmus are in the same position under the Workmen's Compensation Acts as workmen disabled by accident or other industrial disease. At the same time I am aware of the difficulties to which they are exposed in obtaining re-employment, particularly in the present condition of the industry, and my Department are still considering with the Home Office what steps might be taken to help them in this respect. Clearly the best remedy would be to diminish the incidence of the disease, and investigations with that object are in progress. Whilst medical opinion is by no means unanimous, it is generally agreed that defective light is a contributing factor, and it is satisfactory to note that, with the encouragement of my Department, improved lamps are being introduced at many collieries.

Children and Health Insurance.

Mr. HORE-BELISHA asked the Minister of Health whether his attention had been drawn to a recommendation of the medical officer for Plymouth, in his recent annual report on the health of the city of Plymouth, that children of 15 should immediately become insurable so that their school medical records could be passed to panel doctors and so avoid the present year's gap in health supervision; and whether he proposed to take any steps in the matter.—Mr. HAYES (Vice-Chamberlain of the Household) replied: In the event of provision being made by legislation whereby the minimum age for entry into insurance would coincide with the normal school-leaving age, the question of the transfer of the relevant medical records will receive consideration.

Supply of Quinine in India.

Major GRAHAM POLE asked the Secretary of State for India what progress had been made in the consultations between the Government of India and the Provincial Governments on the question of centralising the whole subject of cinchona cultivation, and the manufacture and distribution of quinine, as suggested by the Royal Commission on Agriculture in India, as a first step towards the reduction of the price of quinine in India to a level at which it would be possible to embark on an extensive anti-malaria campaign.—Mr. WEDGWOOD BENN replied: I have no information later than that given on page 14 of Part I. of the Report on the progress made in giving effect to the Royal Commission's recommendations, a copy of which is in the Library of the House.

The Eight Hours Convention.

Sir KINGSLEY WOOD asked the Minister of Labour whether she could make a statement as to the policy of the Government at the recent conference at Geneva in relation to the suggested revision of the Eight Hours Convention.—Miss BONDFIELD replied: At the meeting of the Governing Body of the International Labour Organisation at which this subject was raised, the representatives of the British Government abstained from voting.

Medical Report on "Red Biddy."

Mr. MCELWEE asked the Secretary of State for Scotland whether the report on "red biddy" was available; and, if not, if he could announce a date when it would be.—Mr. ADAMSON replied: I have received a report from the chief medical officer of the Department of Health for Scotland of which I am sending a copy to the hon. Member.

National Maternity Service.

Mr. FREEMAN asked the Secretary to the Treasury the approximate cost of providing a national maternity service covering the services of a doctor, midwife, and anæsthetic administration.—Mr. GREENWOOD replied: The data required for framing even an approximate estimate of the cost of a service of this kind are not yet available.

REBUILDING OF THE MIDDLESEX HOSPITAL. — The court of governors met on June 24th for the last time in the eighteenth century board room. The old furniture has been stored, and Prince Arthur of Connaught, the chairman, said that the contract for the demolition of the last portion of the old building has been signed, and that of the total sum of £1,100,000 needed for rebuilding only £300,000 remains to be raised.

THE LONDON HOSPITAL.—Lieut.-Colonel W. M. Pryor presided at the annual prize-giving of the London Hospital Medical College and Dental School on June 24th. Prof. William Wright, the Dean, in presenting the annual report, referred to the death of Mr. Thomas Openshaw, consulting surgeon, and Mr. F. A. Hocking, pharmacist, to the hospital. During the past year Dr. Leonard Hill, F.R.S., had received a knighthood, Mr. A. J. Walton had been appointed honorary surgeon to H.M. Household, Mr. A. G. Elliott, the house governor, had been made O.B.E., and Dr. Robert Hutchison had been elected senior censor of the Royal College of Physicians. Mr. Evelyn Sprawson had been awarded the Tomes prize of the Royal College of Surgeons, Dr. F. B. Byrom had been granted a Rockefeller Fellowship, and Mr. A. Birnbaum had scored a notable academic success by winning the Dunn exhibitions in both anatomy and physiology in the March examinations of the University of London. Among contributions made to medicine from the hospital during the past year might be mentioned Prof. William Bulloch's report on the sterilisation of catgut, recent research on the virus of psittacosis, Dr. Dorothy Russell's classification of Bright's disease, and Dr. Donald Hunter's work on calcium metabolism. Dr. Paul Fildes was the general editor of the Medical Research Council's monumental "System of Bacteriology." In presenting the prizes Lord Rayleigh, F.R.S., said that to have a chance of contributing to science "it is far more important to be persevering, and to have a fearless regard for truth, and to keep your eyes open to what is going on about you, than to be very clever or very smart, or very apt in saying things and finding a ready retort to any objection that is made." He warned his audience against vague generalisations and high-sounding phrases, and urged them not to be content with answers until they were definite and satisfying. A great many vague theories were held by doctors and the public, and they needed earnest and conscientious investigation. Lord Knutsford and Dr. Robert Hutchison concluded the proceedings with a vote of thanks.

MEDICAL NEWS

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful:—

M.CHIR.

Alexander Simpson-Smith and C. I. Tuckett.

THIRD EXAMINATION FOR M.B. & B.CHIR.

Part I., Surgery, Midwifery, and Gynæcology.—N. W. Alexander, H. B. Bagshaw, W. I. Bain, C. O. Barnes, J. H. Beilby, A. T. Blair, O. H. Bostock, H. G. H. Butcher, G. F. Carey, H. M. Chappel, W. F. Church, J. H. Conyers, O. J. C. Cotton, R. M. S. Cross, C. A. de Candole, R. M. Dowdeswell, W. S. Dyson, R. H. Fish, E. D. Forster, H. S. H. Gilmer, C. E. D. H. Goodhart, S. E. F. Gooding, A. H. Gurney, G. Hale, J. H. Hall, C. J. K. Hamilton, F. R. T. Hancock, J. O. Harrison, W. Heath, T. C. Jameson Evans, H. D. B. Kelly, R. O. Lee, J. D. McVean, H. Mallinson, F. E. Pilkington, V. H. Riddell, N. H. L. Ridley, H. E. W. Roberton, M. H. Salaman, J. G. Sleigh, E. M. P. Smith, D. J. R. Steen, E. S. Stern, H. C. Stewart, M. Sutcliffe, J. W. P. Thompson, A. W. Vaisey, G. W. Whittall, T. D. G. Wilson, F. G. Wood-Smith, and R. H. Young.

Part II., Physic, Pathology, and Pharmacology.—A. F. Alsop, G. O. Barber, J. H. Bentley, R. M. Bolam, F. G. Booker, W. V. Bowman, W. V. Boyle, O. J. C. Cotton, A. C. Crooke, H. Curtis, C. H. England, J. S. S. Fairley, R. H. Fish, W. R. Forrester-Wood, I. J. Franklen-Evans, G. N. Grose, A. S. Hall, P. E. T. Hancock, H. L. Hoffman, F. W. Holdsworth, L. E. Houghton, E. H. Hudson, M. M. St. G. Johnstone, M. Koettlitz, R. O. Lee, P. G. Levick, A. Lister, D. G. Macdonald, S. McDonald, W. M. Macgregor, F. G. Maitland, R. W. Malim, C. E. P. Markby, H. L. Milles, I. B. Morris, B. C. Nicholson, V. P. Paxon, J. O. Poynton, C. B. Prowse, W. Radcliffe, T. G. Reah, J. Richardson, H. W. Sadlier, J. D. Simpson, G. H. G. Southwell-Sander, R. S. Stacey, E. C. Sugden, C. P. K. Toland, J. C. G. Whitelaw, and F. S. Winton.

UNIVERSITY OF OXFORD.—On June 25th the honorary degree of D.Sc. was conferred on Sir Arthur Keith, F.R.S., and on the following day the degree of B.M. was conferred on G. Campbell.

The Board of Awarders has awarded the Osler Memorial Medal for 1930 to Sir Wilmot Herringham. It is given every fifth year to the Oxford medical graduate who has, in the opinion of the Board of Awarders, made the most valuable contribution to the science, art, or literature of medicine, and who has not previously received the medal.

UNIVERSITY OF MANCHESTER.—Dr. Walter Schlapp has been appointed lecturer in experimental physiology, Dr. J. M. Yoffey assistant lecturer in anatomy, Dr. F. N. Marshall and Dr. Donal Sheehan demonstrators in anatomy, and Dr. I. B. Winter demonstrator in human physiology.

UNIVERSITY OF DURHAM.—On June 26th the honorary degree of D.C.L. was conferred on Lieut.-General H. B. Fawcus, Director-General of the Army Medical Services.

LEAGUE OF NATIONS PUBLICATIONS.—Messrs. George Allen and Unwin, Ltd., have taken over the agency, for Great Britain, Northern Ireland and the Crown Colonies, of League of Nations publications. They will conduct all the League business from 38, Great Ormond-street, W.C. 1 (Museum 1439), and not from their address in Museum-street. The London office of the League for all purposes except the sale of publications, remains at 16, Northumberland-avenue, W.C. 2.

PADDINGTON MEDICAL SOCIETY.—At a meeting of this Society to be held at 9 P.M. on Tuesday, July 8th, at the Great Western Hotel, Dr. G. E. Oates, medical officer of health for Paddington, will give an address on Public Health Topics of General Interest. A resolution for the appointment of a section in connexion with the National Health Insurance Acts will be considered and reports will be received from representatives on other bodies.

RECEPTION TO AMERICAN PUBLIC HEALTH ASSOCIATION.—At the London School of Hygiene and Tropical Medicine on the evening of June 27th Sir Harry Goschen and members of the board of management received members of the Association which is on a visit to Europe to attend international congresses of hygiene in Paris and Dresden, their stay in London being very brief. A number of prominent public health officials were invited to meet them, amongst them officers of the Ministry of Health and of the London County Council, medical officers of health of London boroughs, and representatives of the various central voluntary health associations. During the course of the evening Prof. M. Greenwood gave two ten-minute talks in the statistical laboratory, the first on forecasting the trend of infectious diseases, the second on teaching the elements of statistics to public health students. The other laboratories were open to inspection.

A SURGICAL SCHOLARSHIP.—The Association of Surgeons of Great Britain and Ireland invite applications for a scholarship of £350, to enable the holder to pursue a definite line of research or study at home or abroad. Particulars will be found in our advertisement columns.

HEBREW UNIVERSITY OF JERUSALEM.—The children of Mr. and Mrs. F. Warburg have established a Fellowship in public health in the name of their parents. The fund yields £P.120 a year, and will be awarded annually to a young investigator who is to work in the department of hygiene of the University on a problem of special importance to Palestine. Applications should be made in proper form to the director of the department not later than August 31st.

ENLARGEMENT OF CAERPHILLY HOSPITAL.—Seven years ago Caerphilly District Miners' Hospital was opened with 22 beds. Enlargement speedily became necessary, and a new ward block has now been completed containing 54 beds, together with a new out-patients' department, with consulting-rooms for eye, ear, nose, and throat cases.

COLLEGE OF PESTOLOGY.—The College held a reunion luncheon at the Connaught Rooms on June 25th; the Duke of Sutherland, its new President, occupied the chair, and among the guests were Sir Thomas Horder and Sir Aldo Castellani. Colonel S. P. James, of the Ministry of Health, in proposing the health of the College, said that the Ministry sympathised with its aims and recognised their importance to the national health, but that the help of the public, financial and practical, was more valuable than official sympathy. The President appealed for funds to carry on the work of investigation and enlightenment.

ORDER OF THE HOSPITAL OF ST. JOHN OF JERUSALEM.—The King has sanctioned the following promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem:—As Knight of Grace: Dr. W. E. Audland. As Commanders: Dr. L. F. R. Knuthsen, Dr. Ll. A. Morgan, Dr. A. Ellison, Dr. J. F. Arlidge, Dr. J. E. Nevins, Dr. W. M. Cairns, Dr. K. H. Beverley, Lt.-Col. S. M. W. Meadows, R.A.M.C., and Dr. J. H. Chambers. As Officers: Sir John W. Thomson-Walker, Dr. F. Romer, Dr. E. S. Jackson, Dr. Tom Sanderson, Dr. A. J. Young, Dr. H. J. Clutterbuck, Dr. G. S. Phillips, and Dr. J. M. Wilson. As Serving Brothers: Dr. H. C. Darby, Dr. T. Bell, Dr. F. B. G. Holmes, Dr. H. G. Ramsbottom, Dr. N. J. L. Rollason, Dr. E. J. Deck, Dr. Charles Edgar Whitcher, and Dr. E. E. Dufty. As Serving Sister: Dr. Catherine M. Edgerley.

THE CHILDREN'S CLINIC.—A meeting was held in the Women's Service Hall on June 25th in support of the clinic established at 85, Clarendon-road, London, W., for the observation and treatment of nervous and delicate children. Prof. Winifred Cullis, who presided, said that in this country new advances in medicine tended to grow out of the hospital system, first as voluntary enterprise, and then as a link in some way or another with organised medicine. She believed this clinic was the beginning of a movement which had come to stay. Miss Coster, Principal of Wychwood School, Oxford, spoke of the need of emotional training rather than indiscriminate outlet, and pointed out how psychological maladjustment arose from emotional stresses to meet which the child had not been properly prepared. Dr. Margaret Lowenfeld, the honorary medical director of the clinic, set out the relationship of the work of the clinic to national and economic problems, pointing out that £300,000 was spent last year on the maintenance of boys and girls between the ages of 16 and 21 in prison, while in her view it would cost only £30,000 a year to keep them out. Moreover, that £300,000 spent on prisons produced no improvement, and in many cases even produced deterioration. She said that the child world was dream world made out of phantasy, and had little contact with actual life; a child built all his life out of pictures which were the fulfilment of his wishes. In the clinic the child was set to play; his make-believe world came to light, and his desires were understood and adjusted to socially useful ends. Maladjustment and delinquency in children arose from physical and emotional causes. The clinic was staffed by a team of workers who attacked the problem from all sides: social, constitutional, psychological, and biochemical. It had been constructed on lines which allowed of the use of records of every case as permanent material for study. The band of people representing the clinic had used every effort to bring the clinic to its present stage, and now appealed to the public to enable it to be developed.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

SATURDAY, July 12th.—3 P.M. (at the East Suffolk and Ipswich Hospital, Ipswich) Annual General Meeting. Mr. F. F. Ward: The History of the Development of a Venereal Disease Clinic. (Meeting preceded by luncheon for members and their friends at the White Horse Hotel.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

WEDNESDAY, July 9th.—5 P.M., Dr. Harvey Cushing: Neurohypophysial Mechanisms from a Clinical Point of View. (Lister Lecture.)

THURSDAY.—2.45 P.M., Prof. H. R. Dew: Hydatid Disease: Some Interesting Complications. (Hunterian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 7th, to SATURDAY, July 12th.—VICTORIA PARK HOSPITAL, Cambridge Heath, E.. Tues., 2 P.M., Demonstration on Heart Cases by Dr. Shirley Smith. No fee.—SOUTH LONDON HOSPITAL FOR WOMEN, 88, Newington-causeway, S.E. Wed., 2 P.M., Demonstration of Cases by Miss Margaret Basden. Open to women graduates only. No fee.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, July 7th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations

FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

Appointments

BRAIN, W. RUSSELL, D.M., M.R.C.P., has been appointed Assistant Physician to the Royal London Ophthalmic Hospital.

Certifying Surgeons under the Factory and Workshop Acts: BEWES, A. G., L.R.C.P. Lond., M.R.C.S. (Southend); and ROUTH, J. L., L.R.C.P. Lond., M.R.C.S. (Okehampton).

City of London Maternity Hospital: MARSHALL, C. M., M.B., Ch.B. N.Z., F.R.C.S. Eng., Resident Medical Officer; ALLINSON, F. W., M.B., B.S. Lond., Assistant Resident Medical Officer.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Hospital for Sick Children.—Res. H.P. Two Res. H.S's. Also Hon. Asst. S. to Ear, Nose and Throat Dept.

Aberystwyth Infirmary and Cardiganshire General Hospital.—H.S. £200.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—Hon. Surgical Registrar.

Association of Surgeons of Great Britain and Ireland.—Surgical Scholarship. £350.

Barnsley, Beckett Hospital and Dispensary.—H.P. £200.

Bath, Royal United Hospital.—H.P. £120.

Birmingham, Highbury Hospital, Moseley.—Res. Asst. M.O. £300.

Birmingham, Selly Oak Hospital.—Surgeon. £700.

Blackburn Royal Infirmary.—Res. H.P. £175.

Bolingbroke Hospital, Wandsworth-common, S.W.—Res. M.O. Chiefly surgical. £200. Also H.P. At rate of £120.

Bolton County Borough.—Asst. M.O.H. and Asst. School M.O. £500.

Bournemouth County Borough, Malvern and Winton Infant Welfare Centres.—Medical Attendant. 1½ guineas per session.

Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.

British Red Cross Society, Clinic for Rheumatism, Peto-place, Marylebone-road, N.W.—Hon Consulting Surgeons, &c.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. At rate of £120 and £100 respectively.

Charing Cross Hospital, W.C.—Res. Anæsthetist. At rate of £100.

Colchester, Royal Eastern Counties' Institution for Mentally Defective.—Clin. Research Worker. £600.

Croydon General Hospital.—Hon. Anæsthetist.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.

Doncaster Royal Infirmary.—Three H.S.'s, and One H.P. All at rate of £150.

Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.

Egyptian University Faculty of Medicine.—Prof. of Hygiene. £E.1500.

Essex, Administrative County of.—Asst. M.O.H. £500.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Gloucester, Gloucestershire Royal Infirmary, &c.—H.P. and 2nd H.S. At rate of £135 and £100 respectively.

Halifax Royal Infirmary.—3rd H.S. At rate of £125.

Hertford County Hospital.—H.P. At rate of £150.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. At rate of £50.

Hospital for Sick Children, Great Ormond-street, W.C.—Med. Reg. and Pathologist. £300.

Ilford, King George Hospital.—Hon. Neurologist.

Indian Medical Service Commissions.

Inverness Royal Burgh, P.H. Dept.—Asst. M.O.H.

Ipswich Borough Mental Hospital.—Med. Supt. £700.

Kensington, Fulham and Chelsea General Hospital.—Res. Cas. M.O. At rate of £100.

Lancaster County Mental Hospital.—Temp. Asst. M.O. Seven guineas weekly.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool, David Lewis Northern Hospital.—Medical Tutors and Registrars. Each £175. Also Four H.S.'s, and Two H.P.'s. Each £100.

Manchester, City of, Education Committee.—Asst. School M.O. £600.

Manchester Northern Hospital, Park-place, Cheetham Hill-road.—Sen. H.S., and Jun. H.S. £130 and £100 respectively.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester Royal Infirmary, Central Branch, Roby-street.—Jun. H.S. and Cas. O. At rate of £100.

Manchester, St. Mary's Hospitals.—Four H.S.'s. At rate of £50.

Manitoba University.—Asst. Professor of Anatomy. 3500 dollars.

Middlesbrough, North Ormesby Hospital.—H.P. £120.

Middlese County Council.—Asst. M.O. £600.

Mile End Hospital, Bancroft-road, E.—Deputy Med. Supt. £600.

Miller General Hospital, Greenwich-road S.E.—Cas. O. £150.

Ministry of Health, Government Lymph Establishment. Hendon.—Bacteriologist. £700 and bonus.

National Hospital, Queen-square, W.C.—H.P. £150.

Newark General Hospital.—Res. H.S. At rate of £150.

Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Res. Med. Asst. £350.

Newport, Mon., Royal Gwent Hospital.—Hon. Radiologist.

Northampton General Hospital.—Asst. H.S. At rate of £150.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Northwood, Mount Vernon Hospital.—Gynæcologist.

Nottingham General Hospital.—H.S. At rate of £150.

Oldham County Borough Education Committee.—Asst. Sch. M.O. £500.

Plymouth City Hospital.—Med. Supt. £1000.

Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £100.

Poplar Hospital for Accidents, East India Dock-road, Poplar, E.—Second Res. O. At rate of £175.

Portsmouth Royal Hospital.—Cas. O. At rate of £100.

Preston and County of Lancaster Royal Infirmary.—H.S. £150.

Preston, Biddulph Grange Orthopædic Hospital.—Radiographer. £200. Also Jun. H.S. At rate of £150.

Prison Medical Service.—Medical Officer, Class II. £350 and bonus.

Queen's Hospital for Children, Hackney-road, E.—Clin. Asst. for Orthopædic Dept. 5s. each attendance.

Reading, Royal Berkshire Hospital.—Cas. O. and Res. Anæsthetist. Each at rate of £150.

Reading University.—Independent Lecturer in Agricultural Bacteriology. £400–£500.

Rhondda U.D.C.—Asst. M.O.H. and Asst. School M.O. £500.

Royal College of Surgeons of England.—Examiner in Dental Surgery.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. for Out-patient Department. £150.

Salford Royal Hospital.—H.P. and Cas. H.S. Each at rate of £125.

Sheffield Royal Hospital.—H.S. to Ear, Nose and Throat Dept. Also Res. Anæsthetist. Each at rate of £80.

Sheffield Royal Infirmary.—Two H.S.'s. Also Ophth. H.S. Each at rate of £80.

Sheffield, Jessop Hospital for Women.—Registrar and Obstetrical Tutor. £500.

Shrewsbury, Royal Salop Infirmary.—Res. Surg. O. £200.

St. John's Hospital Lewisham, S.E.—Hon. Surgeon, also Res. M.O. £250.

St. Thomas's Hospital.—Jun. Asst. to Venereal Dept. £250.

Swindon and North Wilts Victoria Hospital.—Res. M.O. At rate of £125.

Taunton and Somerset Hospital.—Jun. H.S. At rate of £100.

Truro, Royal Cornwall Infirmary.—H.S. £170.

Walsall General Hospital.—Cas. H.S. At rate of £120.

Warwickshire C.C.—Asst. County M.O.H. £500.

Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.

West African Medical Staff.—M.O.'s. Each £600.

West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—Jun. H.P. At rate of £100.

West London Hospital, Hammersmith-road, W.—Res. Asst. Phys. £300.

Winchester, Royal Hampshire County Hospital.—H.P. £150.

Wolverhampton Royal Hospital.—Cas. O. and H.S. to Ear, Nose and Throat Dept. At rate of £125.

Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Newburn (Northumberland).

NOTES, COMMENTS, AND ABSTRACTS

MENSTRUATION IN SCHOOLGIRLS.*

A SURVEY BASED ON REPLIES TO A QUESTIONAIRE.

THE subject of menstruation is of importance to all persons responsible for the health of women or girls, and the present inquiry was undertaken to fill some obvious gaps in current knowledge. In the year 1925 the London Association of the Medical Women's Federation were approached by a medical officer of health with a request for information about the effect of school games on menstruation, and what rules concerning playing at these periods were usually prescribed to pupils. The Association found that although their members could contribute a great mass of clinical experience on this subject, there was a surprising lack of exact data on this as, indeed, on most other points dealing with menstruation in the normal girl. The difficulty had always been that of finding suitable avenues of approach to a sufficiently large sample group of healthy girls, and of overcoming the obvious objections to questioning adolescents on such an intimate matter.

The Association were fortunate in learning that the Ling Association of trained gymnastic instructresses was about to initiate an inquiry on the same subject. They agreed to join forces and later the generous coöperation of the Headmistresses Association was secured. A questionaire, approved by representatives of the three societies, was drawn up and circulated by the headmistresses to several hundred schools. As it was all important that the questionaire should prove acceptable to mistresses and parents, some of the original points on which the medical women had desired information had to be omitted or greatly modified. The questionaire sent was as follows:—

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

Inquiry dealing with Menstruation in School-children.

(To be filled up in respect of girls who have attained their 14th birthday, and who have menstruated.)

1. Name or Number.....
2. Age.....
3. Previous history:
   - (A) Illnesses (cross out any of the following illnesses the child has not had)—
     (*a*) Rheumatic fever. (*b*) St. Vitus' dance. (*c*) Heart disease.
   - (B) Has the girl had any other illnesses, infectious or otherwise, which kept her away from school? If so, what were they? Give date and duration if possible.
   - (C) Has she had any operation? If so, what was it for? Give date.
4. Age at which monthly periods began.
5. Are they regular? If so, how many days elapse between the first day of the one period and the first day of the next? If not regular, state as precisely as possible how often they occur.
6. Is a record kept of the occurrence of the period?
7. How many days does the period last?
8. Does the girl have any pain? If so, does it come on (*a*) before the period? (*b*) During the period? (*c*) After the period?
9. Does the girl do exercises or play games during the period?
10. Does she wish to? If not, what reason is given?
11. Is she definitely known to have headache at this time?
12. Is she constipated at this time?
13. Do her general health and happiness appear to be as good as usual during the period?
14. Has she ever had to stay away from school owing to periods?

Remarks.—Date. School which the child attends. Signature of parent or school doctor, or gymnastic mistress, or headmistress. N.B.—If preferred, initials may be given instead of the full signature.

The response was unexpectedly large, and the committee cannot express too strongly their thanks to the large number of those who so materially assisted in filling in the forms. Over six thousand questionaires were returned completed, filled in by headmistresses themselves or by assistants on their staff, gymnastic mistresses, the school doctor, parents or in some instances by the children. Such a mass of material has been no easy matter to handle, and the committee were fortunate in securing Prof. M. Lucas Keene and Miss Ethel Hewer, D.Sc., to undertake the scientific review and to direct the course of the analysis.

Satisfactory results could, however, only be obtained under the guidance of an expert statistician, and Prof. Major Greenwood kindly allowed a member of his staff, Miss E. Newbolt, to make a preliminary analysis. She was unfortunately unable to continue the investigation, and Dr. Doris Baker was asked to bring the work to completion. This she has done under the kind direction of Dr. Peter McKinlay, to whom, with Prof. Major Greenwood, the committee is greatly indebted. The tables recording the detailed figures are available for inspection; for reasons of space a few only are here included.

The schools from which replies were received were grouped as follows:—

	Number of schools.	Number of returns.
(*a*) Day schools—		
1. High schools	23	1495
2. Secondary schools	54	3209
(*b*) Boarding schools—		
1. Private	25	1220
2. Charitable institutions	10	175
	112	6099

Statistical Analysis of Results.

The main points which the committee desired to investigate were:—

1. Characteristics of the menstrual period: (*a*) regularity; (*b*) duration.
2. Extent of disability from menstruation during adolescence as indicated by: (*a*) incidence of pain; (*b*) effect on general health and happiness; (*c*) absence from school; (*d*) relation to physical exercise.
3. Relation of length of menstrual history to the above.

Characteristics of Period.

REGULARITY OF PERIOD AND LENGTH OF INTERVAL.

The frequency distribution of the intervals between the periods (reckoning from one onset to another) shows a definite peculiarity—i.e., the lack of any general tendency to fill smoothly on both sides of a maximum value. (For actual numbers see Table I.) Several peaks are apparent, indicating that a heaping up of cases occurs at weekly intervals, three, four, five weeks, with the greatest frequency at 28 days. Similar predilections for round numbers are found in the records of age-distribution at census enumerations, and these should make one hesitate to believe that the detailed distributions of interval given here represents the *true* frequency at each of these days. The results may be divided into three groups:—

(1) Above 28 days and varying	36·3
(2) 28 days or varying above and below	41·7
(3) Below 28 days and varying below	21·9

The percentage recorded as 28 days exactly was 39·2. It was found that the figures given by girls whose actual records were kept, when extracted separately, do not vary significantly from the figures of *all* samples.

Regularity and pain.†—The incidence of regular

* Being a report on an inquiry into menstruation in schoolgirls based on over 6000 replies to a questionaire by a committee of the London Association of the Medical Women's Federation.

† "Pain" includes all degrees, however slight and transient.

periods is definitely slight, though greater among those girls not suffering from pain. The percentage of "regulars" among the "no pain" group was 79·6, compared with 73·4 among the remainder.

Classified in relation to the separate type of pain groups the incidence of regularity is as follows:—

No pain	79·6	
Pain before period	74·4	76·8
„ „ „ (slight)	82·3	
Pain during period	75·0	75·8
„ „ „ (slight)	77·4	
Pain after period	66·7	62·5
„ „ „ (slight)	60·0	
Pain before and during	59·3	59·6
Pain before, during, and after	69·2	

Length of interval and pain.—For the purposes of correlation the distribution of pain has been classified according to its presence or total absence. The interval has been treated in three broad categories:—

(1) Above 28 and varying above.
(2) 28 exactly.
(3) Below 28 and varying below.

The figures, however, do not show results of any positive importance, and the whole series taken together suggests an absence of definite relationship between the two factors. The general conclusion would appear to be that the presence or absence of pain is not dependent on the length of the interval.

(*b*) DURATION OF PERIOD.

The average duration of the periods in all girls in the three groups of schools is as follows:—

High schools	5·14 days.
Secondary schools	4·92 „
Boarding schools	4·76 „
Residential institutions	4·47 „

The returns for individuals were, of course, stated in days and not in fractions of days. The limits of variation were 2 to 14 days, the mean being four or five days. It was noted, however, that some of the girls whose period lasted 14 days played games throughout and made no complaint of pain or ill-health.

As regards the effects of *exercise*, the average duration in the two groups (1) taking full exercise throughout the period, (2) limiting their exercise, shows a difference which is certainly statistically significant. (For actual figures see Table II.)

Girls taking full exercise	5·20 days.
Girls limiting exercise	5·33 „
Difference	0·1382 „

TABLE II.—*Duration and Exercise.*

Days.	Exercise—		Days.	Exercise—	
	Full.	Limited.		Full.	Limited.
1	—	1	7	342	253
2	4	3	8	17	27
3	130	64	8+	11	9
4	637	280			
5	1287	748	Total..	3204	1792
6	776	407			

There is, therefore, a shorter average duration in girls taking exercise throughout the period, but it is impossible to say whether exercise shortens the period or whether the girls with shorter periods tend to take exercise throughout.

There is also a slight but definitely significant relation between *pain* and the duration of the periods. If we consider first of all the two broad groups, those with pain and those without, we find the average duration as follows:—

Girls with no pain	4·81 days.
Girls with pain	5·10 „

The greatest difference is in those suffering both *before* and *during* the period (5·28 days), and is least in those suffering pain only *before*.

No pain	4·81
Pain before	4·88
Pain during	5·12
Pain during and before	5·28

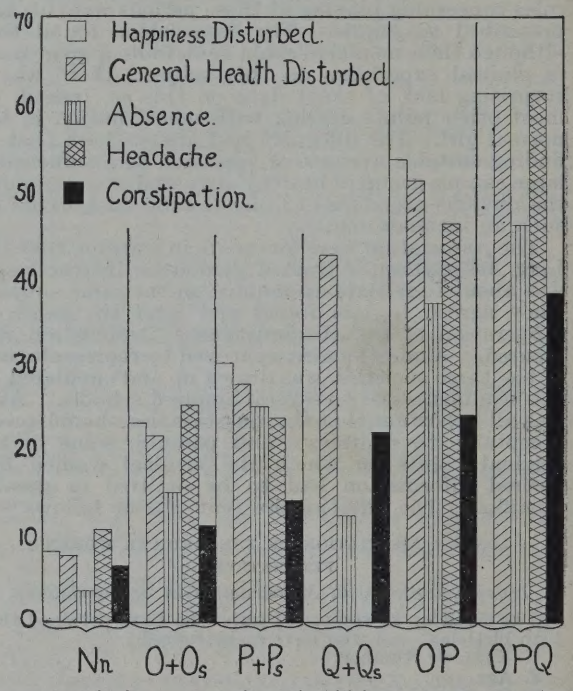
Correlation ratio 0·246 is definitely significant.

Extent of Disability from Menstruation in Adolescence.

INCIDENCE OF PAIN.

The records for three of the groups of schools—the high schools, the secondary schools, and the boarding schools—give results showing a fairly close resemblance one to another. (See Fig. 1.) Something

FIG. 1.



Percentage incidence of various disabilities during the menstrual period. Nn = No pain. O = Pain before period. Os = Pain before period sometimes. P = Pain during. Ps = Pain during sometimes. Q = Pain after. Qs = Pain after sometimes. O.P = Pain before and during. O.P.Q. = Pain before, during, and after.

more than half the total in each group—i.e., 52·4, 55·4, and 59·9 per cent.—are recorded as not suffering from pain, however slight or transient, at any time during the menstrual period. The remaining group (the charitable institutions) show a considerably higher proportion of "no pain" than this—i.e., 71·7 per cent. of the total.

The wide discrepancy between this and the other three groups suggests the influence of some special factor at work here, possibly a difference in the methods of recording the data. As the numbers in this group were very small, they are omitted in any combined work. Considering then only the first three groups, the records show that among those suffering some pain, the majority, slightly more than half (25·9 per cent.) falls in the group *during the period* whereas a negligible proportion only suffer *after* the period (1·6). Only 10·4 claim to suffer *before* the onset, and about the same number (6·8) *before and during* the period. Sufferers over the long stretch, before, during, and after the period, are an insignificant fraction of the whole. (For distribution of pain, see Table III., A, B, C, and D.)

In the three groups of schools the variations in frequency of pain are not very large. The chief differences are in (1) the main group of "no pain," where the high schools show a smaller proportion than the boarding schools; and in (2) the group showing pain *during* the period, in which the pro-

TABLE I.—DISTRIBUTION OF INTERVAL IN SCHOOLS.

Actual numbers.

—	A.C.	B.F.	B.E.	A.D.	A.C., A.D., and B.F.
Above 28	253 } 521	129 } 428	23 } 50	644 } 1023	1026 } 1972
„ „ varying ..	268 }	299 }	27 }	379 }	946 }
28..	(*a*) 437 } 491 (*b*)	(*a*) 321 } 390 (*b*)	(*a*) 20 } 40 (*b*)	(*a*) 1283 } 1384 (*b*)	2041 } 2265
Varying above and below	(*c*) 54 }	(*c*) 69 }	(*c*) 20 }	(*c*) 101 }	224 }
Below 28..	175 } 232	114 } 165	26 } 37	378 } 471	988 } 1189
„ „ varying ..	57 }	51 }	11 }	93 }	201 }
Total (*b*)	1244	983	127	2878	5426
Total (*a*)—i.e., omitting (*c*)	1190	914	110	2777	5202

(*a*) = Omitting (*c*) viz.: those varying both above and below 28. (*b*) Including (*c*) and putting them in the 28 group.

TABLE III. (A).—DISTRIBUTION OF PAIN.

—	No pain.		Pain sometimes.		Not recorded.		Total.	Total recorded.
	No.	Per cent. of those recorded.	No.	Per cent. of those recorded.	No.	Per cent. of total.		
A.C.	788	52·4	734	48·2	21	1·4	1543	1522
A.D.	1769	55·4	1420	44·5	26	0·82	3214	3188
B.F.	712	58·9	495	41·0	13	1·1	1220	1207
B.E.	119	—	47	28·3	10	6·0	176	166
All except B.E...	3269	55·2	2696	45·6	60	1·0	5977	5917

TABLE III. (B).

—	No pain.		Pain sometimes, either before, during, or after.		Pain either before, during, or after.		Pain before and during.		Pain before, during, and after.		Total recorded.
	No.	Per cent. of those recorded.	No.	%	No.	%	No.	%	No.	%	
A.C. ..	788	52·9	192	12·6	407	26·7	132	8·7	3	0·2	1522
A.D. ..	1769	55·4	343	10·8	878	27·5	190	6·0	9	0·28	3188
B.F... ..	712	58·9	155	12·8	260	21·5	79	6·5	1	0·08	1207
B.E... ..	119	71·6	5	3·0	31	18·7	10	6·0	1	0·6	166
All except B.E...	3269	52·2	690	11·7	1545	26·1	400	6·8	13	0·2	5917

TABLE III. (C).

—	No pain.		Pain before, always, and sometimes.		Pain during, always, and sometimes.		Pain after, always, and sometimes.		Pain before, and during.		Pain before, during, and after.		Total recorded.
	No.	Per cent. of those recorded.	No.	%	No.	%	No.	%	No.	%	No.	%	
A.C.	788	52·9	131	8·6	466	30·6	2	0·1	132	8·7	3	0·2	1522
A.D.	1769	55·4	367	11·5	849	27·0	5	0·2	190	5·9	9	0·3	3188
B.F.	712	58·9	127	10·5	285	24·0	3	0·2	79	6·5	1	0·08	1207
B.E.	119	71·6	21	12·7	2	12·1	0	0	10	6·0	1	0·6	166
All except B.E...	3269	55·0	625	10·7	1600	27·0	10	0·16	400	6·7	13	0·22	5917

TABLE III. (D).

—	Nn.		O.		Os.		P.		Ps.		Q.		Qs.		O.P.		O.P.Q.		N.R.		Total.	Total recorded.	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		No.	%
A.C. ..	788	52·9	93	5·11	38	2·49	313	20·5	153	10·0	1	0·07	1	0·07	132	8·6	3	0·19	21	1·4	1543	1522	98·6
A.D. ..	1769	55·4	258	8·09	109	3·41	617	19·35	232	7·27	3	0·09	2	0·06	190	5·95	9	0·28	26	0·8	3214	3188	99·1
B.F. ..	712	58·9	82	6·29	45	3·64	177	14·5	108	8·80	1	0·08	2	0·16	79	6·5	1	0·08	13	1·1	1220	1207	98·9
B.E. ..	119	—	13	—	3	—	18	—	2	—	—	—	—	—	10	—	1	—	10	—	176	—	—
All except B.E.	3269	55·2	427	7·2	191	3·2	1106	18·6	492	7·3	5	0·08	5	0·08	400	6·8	13	0·2	60	1·0	6977	5917	98·9

A.C. = High schools. A.D. = Secondary schools. B.F. = Boarding schools. B.E. = Residential institutions. Nn. = No pain.
O. = Pain before period. Os. = Pain before, sometimes. P. = Pain during. Ps. = Pain during sometimes. Q. = Pain after.
Qs. = Pain after sometimes. O.P. = Pain before and during. O.P.Q. = Pain before, during, and after. N.R. = Not recorded.

portion is greatest in the high schools and least in the boarding schools.

The figures for incidence of pain have been taken out separately for those with a menstrual history of one year or less. Comparison of these with the total series shows that the exclusion of those with short history reduces the proportion with no pain. The increased frequency of pain with longer experience chiefly falls in the group "pain *during* the period." The suggestion conveyed by the figures is that at the *onset* of menstruation fewer suffer pain than later in life, the chief increase being among girls suffering pain *during* the period.

The degree of pain was not specifically asked for in the questionaire, but 700 returns stated that pain was "slight." Only 61 out of 6099 complained that the pain was "bad" or "much" or "severe."

Schools—	Slight.	Severe.	Total returns.
High	218	13	1495
Secondary	366	43	3209
Boarding	116	5	1220

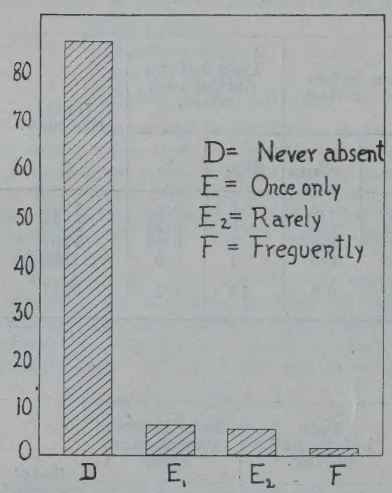
EFFECT ON HEALTH AND HAPPINESS.

The total number of those recording an adverse effect on health and happiness was as follows:—

Schools—	Happiness disturbed.	General health disturbed.	Headache.	Constipation.
High ..	25·43	23·44	19·49	12·78
Secondary ..	17·86	16·50	19·06	9·89
Boarding ..	14·51	15·28	16·29	8·64

Thus headache, disturbed happiness, and interference with general health are in that order the most frequent concomitant effects of menstruation recorded. The association with pain is marked. The disturbance of health and happiness are nearly four times (3·7) as heavy an incidence in the girls complaining of pain as in the "no pain" group. Headache and constipation are only two to three times as frequent in the "pain" group.

FIG. 2.



Percentage of absences during menstrual period.

Inspection of the results for the individual pain groups shows a fairly definite order. The incidence of all these concomitant factors is lowest *before*, increases *during*, and still further *after*, and reaches the highest value in those with the long stretches of pain *before, during and after* the period.

ABSENCE FROM SCHOOL.

The total number of girls recording absence from school is as follows. (See Fig. 2.)

Schools—	Rare.	Frequent.
High	13·85	1·95
Secondary	12·6	1·07
Boarding	7·65	0·84

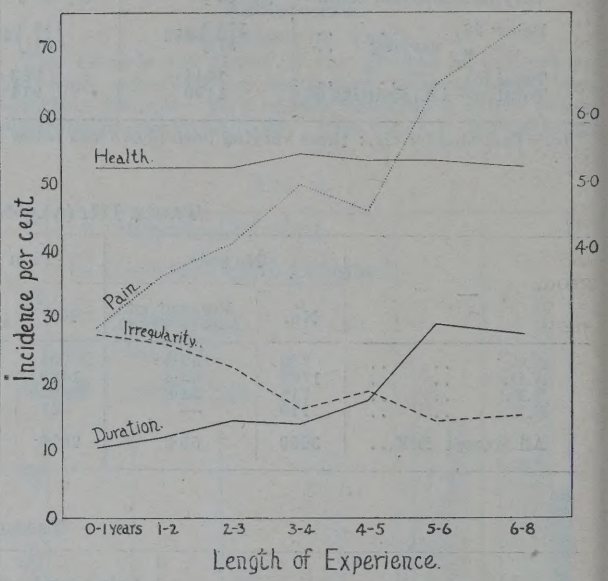
The figures for the three groups of schools have been classified as (1) no absences, (2) absent once only, (3) absent occasionally, (4) repeated absences.

	Schools.		
Absent—	High. Per cent.	Secondary. Per cent.	Boarding. Per cent.
Never	83·3	86·5	91·9
Once	8·6	6·6	3·3
Rarely	6·1	5·8	3·8
Repeatedly	2·0	1·1	0·9

The average of those who are never absent is, therefore, high, while serious absences are a negligible proportion—under 2 per cent.

Absence from school may, therefore, be considered an infrequent event. It is six times more common among those who record pain, and habitual absence is ten times more frequent in this group.

FIG. 3



Relation of health, pain, irregularity, and duration to length of menstrual history.

EXERCISE.

The practice of the three groups of schools in regard to exercise‡ during the period show quite an appreciable difference.

Schools—	Per cent.	
High	57·8	exercise during the entire period.
Secondary	69·8	
Boarding	40·9	

The difference is due to the greater restrictions on exercises (either throughout the period or for the first two or three days) in the boarding schools than in day schools.

Pain and exercise.—The returns have been classified into: 1. (*a*) Groups with pain, and (*b*) No pain. 2. (*a*) Full exercise throughout the period, and (*b*) Exercise limited.

	GROUPS WITH PAIN. Exercise—		NO PAIN. Exercise—	
	All the time.	Limited.	All the time.	Limited.
High ..	49·3	50·7	72·7	27·3
Schools—				
Secondary ..	66·7	33·3	83·3	16·7
Boarding ..	31·5	68·5	50·8	49·2

The results show association of quite a definite kind between the two factors of pain and exercise, the proportion of those taking exercise all the time who experience no pain being substantially greater than the proportion among those who do *not* have exercise all the time. The correlation could, of course, be interpreted the opposite way by saying that a greater proportion of girls who have no pain take exercise throughout the period than of those who *do* have pain. The figures only show that the two factors, absence of pain and exercise, are significantly associated; they cannot show which is cause and which is result. Whether, in fact, it is the taking of exercise which tends to reduce the frequency of pain, or whether it is the absence of pain which permits the indulgence in exercise the figures do not show.

‡ "Exercise" here only refers to formal exercises and organised games and *not* to out-of-school activities.

Relation of Length of Menstrual History to Above.

The length of menstrual history is found to range from under one year to eight years, and has been worked out for tabular presentation at yearly intervals. (See Fig. 3.) The incidence of *disturbance of general health, pain, and absence from school* is found to increase steadily and gradually throughout the whole range of the menstrual histories here recorded. (The groups 6 to 7 years and 7 to 8 years have been combined owing to the smallness of the numbers available.) Next in order comes *disturbance of health*, where the rate increases nearly threefold from the beginning of menstrual history till the end of the eighth year. *Pain* (all degrees) increases from 28 per cent. to 73 per cent. within this period. On the other hand, there is a definite reverse movement in the case of *irregularity*. Here there is a substantial decrease in incidence with increasing length of history, the rate falling from 27 per cent. in the first year to 15 per cent. in those of 6 to 8 years' experience. The average *duration* of the period has been calculated for each group, and there is obviously no evidence of association —the duration of menstruation does not change significantly with increased length of menstrual history.

Summary.

1. The distribution of the interval between the periods is peculiar and suggests a predilection for whole weeks—i.e., the frequencies recorded at 21, 28, and 35 days seem exceptionally high. The most frequently occurring interval is centred on 28 days.

2. The presence or absence of pain does not seem to be sensibly correlated with length of interval.

3. The regularity of the period is significantly but slightly related to pain, the proportion recorded as regular being more in the "no pain" group than in all others.

4. The average duration of the period is definitely but very slightly lower among girls taking full exercise throughout the period.

5. The duration is longer (about one-third of a day) in those who suffer pain than in those who do not.

6. Slightly more than half of the girls studied do not suffer pain or discomfort, however slight, at any time during the menstrual period.

7. Of those recorded as suffering pain, the majority suffer *during* the period only.

8. The difference in the incidence of pain in the three groups of schools (high, secondary, and boarding schools) when analysed separately are not very large.

9. The distribution of the number of girls taking full exercise throughout the period in the three groups of schools shows appreciable differences, and contrasts with the much smaller differences between the groups of schools in respect of incidence of pain.

10. Pain and exercise seem to be definitely related one to another, but from these data it is impossible to suggest which is cause and which is effect.

11. The incidence of disturbed happiness or general health, headache, and constipation is definitely related to the presence of pain, the influence being most apparent in the case of disturbed health and happiness and least in headache and constipation.

12. Absence from school is definitely related to the occurrence of pain, but regular or frequent absence is very rare at any time during adolescence.

13. The time in the menstrual cycle at which the pain occurs is related to all the above factors. The incidence of all of them increases steadily and gradually in the following order: With no pain; pain before the period; during the period; after; and before, during, and after the period.

14. Comparison of the whole series and that obtained by excluding girls with a history of one year or less suggests that at the early period of menstruation a smaller proportion of girls suffer pain than later, during the age-period studied (onset to 18).

15. Analysis of the whole series by years shows that the rise of incidence of pain is steady and gradual throughout the menstrual histories studied. The rate increase over 8 years is less than three times the original value.

16. The incidence of disturbed general health and happiness also increases progressively with length of menstrual history.

17. Irregularity definitely decreases in incidence with increasing length of history.

18. The average duration of the period shows no tendency to rise or fall with increasing length of history.

Commentary.

In considering the results of the inquiry the London Association of the Medical Women's Federation desire to call attention to certain features of the questionaire which inevitably limited the scope of the inquiry and rendered the answers less informative than they could have wished. In the first place, it has been found impossible to elicit from the figures the average age of onset. This could only have been done by taking sample groups of girls and ascertaining which of them had begun to menstruate and which had not. The headmistresses considered that it would be injudicious to risk causing offence by questioning children who had not yet menstruated; hence in nearly all schools papers were only issued to girls known to have attained puberty. It is felt to be particularly unfortunate that no mention of *menorrhagia* was permitted on the questionaire, as many aspects of this condition call for further investigation. On *regularity* it was found difficult to get accurate answers in spite of explicit questions. The tendency was to express the intervals in weeks, although there was some doubt if this was strictly accurate. A very large number of girls kept no written record, but in comparison of the two groups there was less difference than might have been expected.

It will be noted that the degree and the duration of "pain" were not asked for. It is noteworthy, however, that only 61 stated that the pain was "bad" or "severe" or "much," and 700 explicitly stated that it was slight. It is remarkable to have ascertained that over 55 per cent. of schoolgirls have no pain or disability at all at a time when popular tradition pictures their lives as so profoundly affected by this physiological change. The apparently high percentage of pain should be read in connexion with the returns for absence. Experience teaches that if a girl has more than trivial or quickly passing pain she is not sent to school, yet the "absences" are extremely low and the habitual absences negligible. The whole picture presented suggests that the pain of menstruation is in the vast majority of cases slight and of very short duration and constitutes no serious interference with the girl's routine of life.

Some of the pain recorded occurred only "after" the period and in a small percentage "before, during, and after." There is much reason to suppose that such pain would not be truly of menstrual origin. There is a well-known tendency to connect any recurrent physical symptom in girls, especially abdominal pain, with this function, and most chronic appendices and obscure hepatic and digestive troubles get swept into the net.

From replies to Questions 8 and 10, the Commitee of Investigation received the definite impression that much of the discomfort complained of, and some of the disinclination to play games, was due to lack of appropriate toilet facilities and possibly of proper teaching in the hygiene of the period. The discomfort due to chafing may be just as severe a handicap on activity as actual dysmenorrhœa, but it is still true that at many playing fields and even in some schools no facilities for the necessary change are provided. There is no doubt that for this reason alone many girls refrain from active exercise during the period. A few mothers mentioned this difficulty specifically in returning the questionaires, and asked for improvements in the school arrangements. It would seem very desirable that any girl should be able to obtain a fresh towel and to dispose of a soiled one either at school or in the playing pavilion. Any traditional fear of washing should, of course, be removed if it still exists.

The question on exercise was not very happily worded, for unfortunately the questionaire did not

distinguish between free-standing and gymnastic exercises, although their effect on the menstruating girl is very different. Question 10 "Does she wish to (play games)? If not, what reason is given?" left room for an ambiguity not foreseen. Many papers answered "yes," but it appeared from Question 9 that the girl did not in fact play during the period! The reason why she did not was left obscure.

The committee would be glad to see the inquiry extended over the later years of adolescence and womanhood. It is important to ascertain, for example, what degrees of disability are present in girls at college and at work, what hygienic rules diminish such disability, and to what extent complete regularity of periods becomes established among normal women.

The members of the subcommittee responsible for this report are Dr. Christine Murrell (president), Prof. M. Lucas Keene, Dr. Lilian Jeffreys, Dr. Kate Platt, Dr. Ellen Pickard, and Dr. Letitia Fairfield (secretary).

MR. GANDHI AND "THE LANCET."

UNDER the heading of Notes from India in our issue of March 8th, our India correspondent said:

"Whatever political agitators may say, and in spite of the growth of medical education in India, that country will need British doctors for a long time to come. Even Mr. Gandhi (who was himself operated on by a British surgeon in the I.M.S.) would probably admit the truth of this statement."

According to the *Sind Medical Journal*, Mr. Gandhi has replied as follows in the columns of *Young India*:

"The insinuation made by the writer in THE LANCET is baseless and vicious. At the time the operation was performed I was certainly a prisoner, but I was given the choice of having my own surgeon to perform the operation. I did not distrust Col. Maddock, the British surgeon referred to, and the late Dr. Dalal and Dr. Jivaraj Mehta (my surgeon and physician respectively) not having arrived in time, the operation was performed by Col. Maddock, whose care and attention I have acknowledged more than once. I have never felt the dearth of Indian surgeons or physicians of the highest calibre. Indeed, I have sent several of my European friends to Indian surgeons and physicians, and they have derived full benefit from the skill of these Indian medical men. It is in military science alone, thanks to the British policy, that India perhaps stands in need of assistance from European instructors. But so far as I am aware, in every other department, if the British withdrew, India could be self-contained without the slightest difficulty, and that in spite of open or veiled obstruction from the ruling caste."

Our India correspondent writes: "Mr. Gandhi's statement is correct. He asked for an Indian surgeon in the first place. He was wired for but could not come in time."

TULARÆMIA IN THE LEMMING.

HITHERTO the lemming has been regarded mainly as a nuisance to farmers and a warning to the obstinate. Sweeping down in millions from the mountains to the farms surrounding the lakes and fjords, these fearless little black-and-tan rodents acknowledge no obstacle; when they meet a man, they express their opinion of him in terse squeaky barks instead of passing by on the other side in apologetic silence; and when they encounter a lake or fjord in their migrations, they swim it—or try to. The sequel is often the pollution of the Norwegian waterways with countless corpses. As Dr. T. Thjötta, of the Army Bacteriological Laboratory in Oslo, points out in *Tidsskrift for den Norske Laegeforening* for June 1st, the public in districts subject to lemming invasion has identified certain symptoms with this rodent, grouping them under the collective term "lemming disease." The reports of medical officers of health seem, indeed, to suggest that there are at least two diseases traceable to the lemming: a gastro-intestinal form caused by paratyphoid *coli* bacilli, and a glandular form. Thjötta has examined an example of the first form bacteriologically, but what is of more interest in connexion with the present world-wide study of tularæmia is his correlation of its manifestations with those of the glandular form of "lemming disease." They are, indeed, so like each other that, in his opinion, "one is fully warranted in identifying 'lemming fever' with tularæmia until the contrary has been proved." He has already demonstrated the existence of tularæmia in Norway among persons shooting hares or selling them in shops, and he has published 11 serologically proven cases. His first case was that of a medical man who, after shooting hares in the autumn of 1929, developed the ulcero-glandular form of the disease and was ill for months though still able to work. All, or nearly all, of the cases hitherto reported from Norway have been associated with hares, but as lice, flies, ticks, rats, and squirrels have been incriminated in one way or another in the propagation of this disease in other countries, it is probable that in Norway also its diagnosis in persons having no association with hares is only a matter of time. Dr. Thjötta's tentative inclusion of the lemming among the carriers of tularæmia will assuredly attract much material to his laboratory, and the forthcoming reports will be awaited with interest.

Births, Marriages, and Deaths

BIRTHS.

FOTHERGILL.—On June 22nd, at Ambleside, Westmorland, the wife of Dr. E. L. Fothergill, of a son.

MATTHEWS.—On June 23rd, at Newbridge-road, Bath, the wife of Dr. E. Russell Matthews, of a daughter.

SHARP.—On June 25th, at Welbeck-street, W., the wife of Dr. B. Buckley Sharp, of a son.

MAYBURY.—On June 6th, at Tulagi, British Solomon Islands, the wife of Lysander Montague Maybury, M.A., M.B., B.Chir., D.T.M. and H., of a son.

MARRIAGES.

ANDERSON—HAYES.—On June 26th, at the Church of Our Lady of Dolours, John Keith Anderson, M.B., Ch.B., to Geraldine Juliana Gregg Hayes, L.R.C.P. Lond., M.R.C.S. Eng.

CAUTLEY—MEDWIN.—On June 24th, at St. Benedict's Priory, Ealing, Ronald L. Cautley, L.D.S. R.C.S. Eng., to Ena Lillie, younger daughter of Mr. and Mrs. John Medwin, of Ealing.

DEWES—NEVILLE-ROLFE.—On June 25th, at Flax Bourton, Gordon Cripwell Dewes, M.D. Camb., M.R.C.P., to Ione, eldest daughter of Captain Herbert Neville-Rolfe, D.S.O., R.N., and Mrs. Rolfe.

DOCKRAY—SANDS.—On June 25th, at Kinross East Church of Scotland, Edgar Dockray, M.B., Cobham, Surrey, to Margaret Maud, only daughter of David Sands, Esq., Kinross, formerly of Curityba, Brazil.

GLYNN—GIBSON.—On June 28th, at All Saints', Ennismore-gardens, S.W., Dr. Noel Trelawney Glynn, M.R.C.P., to Dr. Christine Gibson, daughter of Mr. and Mrs. H. Y. Gibson, of Duddingston House, Sunbury-on-Thames.

MACVICKER—BULTEY.—On June 28th, at St. James's, Piccadilly, George Colin Churchill MacVicker, B.A., M.R.C.S., L.R.C.P., to Joan Eleanor, second daughter of the late Mr. and Mrs. Ayerst H. Bultey, of Hampstead.

DEATHS.

BERINGER.—On April 25th, at Kyoto, Japan, F. J. A. Beringer, M.R.C.S., L.R.C.P., aged 55, late Director of Medical and Sanitary Services, Sierra Leone.

GERVIS.—On June 30th, at Shepway, Seaford, Sussex, Charles Berkeley Gervis, M.D., M.R.C.S., L.R.C.P., aged 54.

PRANKERD.—On June 26th, at Hornsey-lane-gardens, Orlando Reeves Prankerd, M.D. Edin.

ROCKLIFFE.—On June 23rd, at Selioke, Hessle, Yorks, William Craven Rockliffe, M.A., M.D., aged 81.

SUCKLING.—On June 24th, at Wolverene, Cliftonville, Margate, John Jerome Suckling, M.B., B.S. Lond.

WILLIAMS.—On June 24th, at Caeronnen, Bangor, William Lloyd Williams, M.B., J.P., formerly of Llanberis, aged 75.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

DIPLOMA IN TROPICAL VETERINARY MEDICINE.—The University of Edinburgh and the Royal (Dick) Veterinary College, Edinburgh, have decided to institute in October, 1930, a course for a diploma in tropical veterinary medicine. The institution of this course follows upon the suggestion made by the Lovat Committee on the Colonial Veterinary Service that adequate post-graduate training in this subject should be provided.

ADDRESSES AND ORIGINAL ARTICLES

THE RESERVE FORCES OF THE KIDNEY.*

BY E. B. VERNEY, M.B. CAMB., F.R.C.P. LOND.,
PROFESSOR OF PHARMACOLOGY IN THE UNIVERSITY OF LONDON, AT UNIVERSITY COLLEGE.

WE may consider the capacity of the kidney to perform an increased amount of work as being determined by the quantity of renal tissue at rest at the time and by the magnitude of its response to any given stimulus. The former may be referred to as the structural, the latter as the functional reserve of the kidney. Both are doubtless closely interconnected, but for the purposes of this lecture it will be convenient to consider them separately.

The Structural Reserve.

Nearly one hundred years ago William Bowman published the results of his carefully conducted investigation "On the structure and use of the Malpighian bodies of the kidney, with observations on the circulation through that gland." He was led to conclude that

"all the blood of the renal artery (with the exception of a small quantity distributed to the capsule, surrounding fat, and the coats of the larger vessels) enters the capillary tufts of the Malpighian bodies; thence it passes into the capillary plexus surrounding the uriniferous tubes, and it finally leaves the organ through the branches of the renal vein. . . . With the inconsiderable exceptions just mentioned the terminal twigs of the artery correspond in number with the Malpighian bodies. . . . The blood leaving the Malpighian tufts is conveyed by their efferent vessels to the great renal reservoir, the capillary plexus surrounding the uriniferous tubes. . . . The vessels lie in the interstices of the tubes, and everywhere anastomose freely so that throughout the whole organ they constitute one continuous network lying on the outside of the tubes, in contact with the basement membrane."

Since the vessels bathing the tubules are capillary in character the capacity of one part of the vascular network to feed an adjacent part is extremely limited. The occurrence and character of infarcts in the kidney bear adequate testimony to the rigidity of this restriction in that they demonstrate the dependence of a tubule for its blood-supply on the patency of its respective glomerular tuft, or at least on the transmission of blood through those glomeruli which preside over tubules in its immediate neighbourhood. Bowman clearly recognised and described the repetitive character of the architecture of the kidney, and realised that the functional response of the kidney at any time was the integral of the responses of its individual units. The recent researches of H. F. Traut have shown that a human kidney contains approximately four and a half million such units. The normal man, then, possesses roughly ten million glomerulotubular units, each of which must be regarded as capable of furnishing its quotum of fully formed urine. The possibility that the structure as described by Bowman might form the basis for an alternation of function between the various parts of the kidney was realised by Hermann and given a concrete basis in fact by the beautiful experiments of Richards and his colleagues. They were able to observe directly in the frog's kidney an intermittence of glomerular circulation, an intermittence which was on the one hand unrelated to the heart beat, and on the other asynchronous in the group of glomeruli under observation. The number of units is so large that the possibility must be entertained of the kidney as a whole functioning efficiently under normal conditions when each unit comprising it works for a fraction only of its time. This alternation of activity and rest which the units of the kidney undergo may be looked upon as the concrete representation of its first line of defence against the inroads of disease, and of a part of its total capacity for dealing with an increased load of work. The mobilisation of this structural reserve was actually seen in operation after the intravenous injection of diuretic substances, such as urea, caffeine, and sodium sulphate, and following section of the sympathetic nerve-supply of the kidney. Is there any evidence that the units composing the mammalian kidney enjoy rest pauses of the existence of which direct proof is forthcoming in the case of the kidney of the frog?

EVIDENCE IN FAVOUR OF A STRUCTURAL RESERVE IN MAMMALS.

The evidence is indirect, and depends upon an appreciation of the mode of response of the mammalian kidney to an increase in the intensity of an applied stimulus.

The dependence of the kidney on an adequate blood pressure in order that its secretory activity may be initiated and maintained was demonstrated by Goll, a pupil of Ludwig, in 1854, and since that time much work has served to confirm the validity of his original observations. Changes in the pressure of blood-supply to the kidney, provided an adequate blood flow is maintained, are reflected in like changes in the rate of urine secretion, and these changes in rate are, as Ludwig pointed out, themselves accompanied by characteristic changes in the composition of the urine. As the rate increases the concentration of urea falls, and as a general rule we may say that increases in rate of urine flow are accompanied by an approach in the composition of the urine towards that of the blood plasma.

It might be expected, therefore, that any difference in the simultaneously observed rates of secretion by the two kidneys of an animal would be reflected in an accompanying difference in the chemical compositions of the urines, the higher rate showing a nearer approach towards, the lower a further recession from, the composition of the blood plasma. That such is usually the case with respect to urea was shown by Hermann in 1859. Hermann collected the urine from each ureter in the narcotised dog and was able to confirm the experience of Goll and Ludwig that the two kidneys commonly furnished unequal volumes of urine in the same interval of time. First one then the other secreted more rapidly, and the occurrence of this rhythm disproved the validity of any interpretation in terms of a difference in the structure of the two kidneys. The rhythm could manifestly receive a complete explanation in terms of an alternate waxing and waning of the pressure stimulus uniformly distributed throughout the kidney, were it not for the fact that the higher rate of flow was occasionally accompanied by a higher concentration of urea in the urine. This association led Hermann to postulate that an inequality in the simultaneously observed rates of urine secretion by the two kidneys might rest not only on a difference in the rates of secretion by each kidney as a whole, but also on a difference in the rates of secretion by different parts of the same kidney. He points out that if one assumes that the kidney of one side secretes throughout at a slow rate, whilst on the other side one part rests and the

* The Sydney Ringer Lecture delivered at University College Hospital Medical School, London, on March 17th, 1930.

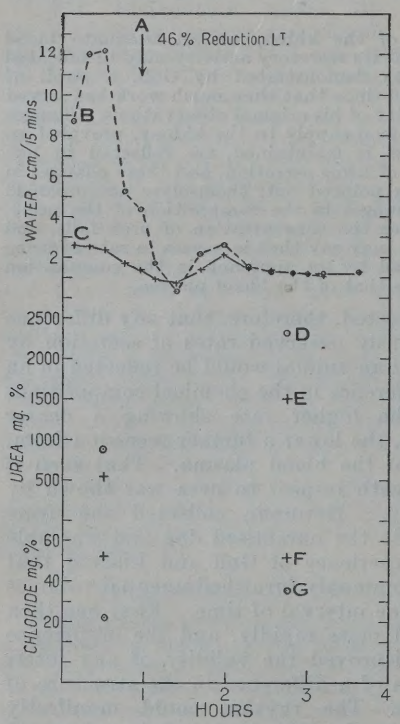
remainder secretes rapidly, the urine from the one kidney may be collected more rapidly in spite of its being more concentrated than that simultaneously collected from the other.

These observations of Hermann have been recently confirmed in part in the unanæsthetised dog by Miss L. M. Pickford and myself, and the possibility investigated of calling into activity renal units hitherto dormant.

At a preliminary operation under ether anæsthesia a fine silver cannula is implanted in the upper part of each ureter in such a manner that its upper end lies free in the renal pelvis. The lower end of this cannula is attached by a length of fine rubber tubing to a short glass cannula inserted into the lower end of the ureter and fixed in such a position that its tip protrudes into the cavity of the bladder. To this end of the glass cannula is attached a further length of rubber tubing, which in its turn is passed down the urethra to the exterior.

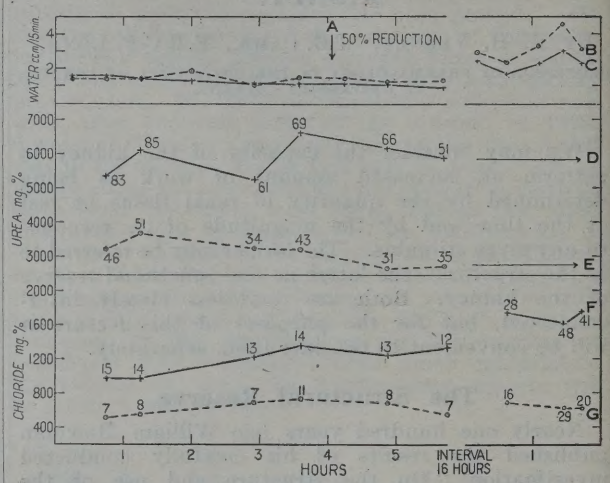
The secretion of one kidney may thus be collected separately from that of the other, and observations made thereon after the animal has recovered from the operation. It is found that under such circumstances the rates of secretion and the compositions of the urines are usually identical on the two sides. When the rates of flow are unequal the more slowly secreted urine has, as a rule, the higher content in urea. Occasionally, however, the reverse is seen, and in Fig. 1 are given the results of an experiment in which this phenomenon is exhibited. It will be observed that the rate of secretion by the left kidney is two to five times greater than that by the right, but that the urine from the left side contains not a lower but a higher percentage of urea than that from the right side. The simplest interpretation of the facts here depicted would appear to be that in the right kidney relatively few units were working at comparatively high pressure, whilst in the left kidney a very much larger number were engaged at a relatively low pressure. A large structural reserve on the right side was being maintained at the expense of an encroachment on the functional reserve of those units engaged in secreting urine. At the point A the circulation through 46 per cent. of the left kidney was suddenly arrested by occluding the posterior primary branch of the renal artery by a method which will be described in a moment. The rates of urine flow on the two sides were by this means brought to approximate equality but the sign of the difference in composition was maintained. The results of Hermann's work, confirmed by such an experiment as has just been described, must, I think, be interpreted as evidence that the number of active renal units in the one kidney, and their degree of activity at any one time, may be independent of the number of active units and the degree of activity of those in the other kidney.

FIG. 1.



B = rate of water elimination by the left kidney; C = that by the right kidney. D = concentration of urea in urine from left kidney; E = that in urine from right. F = concentration of chloride (as NaCl) in urine from right kidney; G = that in urine from left.

FIG. 2.



B = rate of water elimination by the left kidney; C = that by the right kidney. D = concentration of urea in urine from right kidney. E = that in urine from left. F = concentration of chloride (as NaCl) in urine from right kidney; G = that in urine from left. The figures on the urea and chloride graphs represent the amounts (in mgms.) of urea and of chloride (as NaCl) respectively, secreted in 15 minutes.

MOBILISATION OF THE STRUCTURAL RESERVE.

With such evidence before us of there being a varying amount of reserve tissue in the kidney, evidence direct in its nature in the case of the frog's kidney, indirect in the case of the mammal's, we may inquire whether a reduction in the amount of kidney substance is accompanied by an increase in the number of active units in the remaining parts of the kidney. An attempt has been made to answer this question, and although the experiments have as yet yielded results which are more equivocal than might be desired, yet they do point to there being, under certain as yet undefined circumstances, a calling into activity of dormant units in response to arrest of the circulation through a part of the kidney. The preparation used in these experiments is similar to that already described with the addition that means are afforded of ligating a branch of or the whole renal artery of the dog in the unanæsthetised state.

At the operation, during which the ureters are extended to the surface as already described, a fine Bowden cable is fixed to the posterior abdominal wall in such a position that its upper extremity lies behind the left kidney. The lower end of the Bowden tube is passed into the left Fallopian tube to reach the exterior through the uterus and vagina. A silk thread fixed at the upper end of the Bowden tube loops loosely around the renal artery or one of its branches, and passes to the exterior along the centre of the tube. The possibility is thus presented of arresting the blood flow through the renal artery or one of its branches by simple traction on the centre core of the Bowden tube. This can be done later without causing the least disturbance to the animal. The acute effects of this procedure on urinary secretion may thus be observed under environmental conditions and correspondences closely approaching the normal.

If, now, arrest of the circulation through a part of the kidney called into activity a number of units

which were previously dormant, we should expect a relative increase in the rate of urine flow from the non-infarcted region without there being any marked change in the composition of the urine. That such may indeed occur is indicated by the results of the experiment illustrated in Fig. 2. The observations were made four days after the operation, at a time when the animal was perfectly fit, as indicated by the excellence of its appetite and its freedom from fever. At A the posterior branch of the left renal artery was occluded. Post-mortem examination showed that about 40 per cent. of the kidney substance on the left side had been functionally excluded by ligation of the arterial branch. In spite of this, however, neither the rate nor the composition of the urine on the left or the right side was appreciably altered.

The determination, on the one hand, of the sequence of events involved in the production of this increase in the rate of secretion by the non-infarcted mass of kidney tissue, and on the other of the conditions under which it may be observed, must be left to further experimentation, but the interpretation of the results obtained would seem to lie in terms of a mobilisation of a greater or smaller part of the anatomical reserves of the affected kidney.

The Functional Reserves.

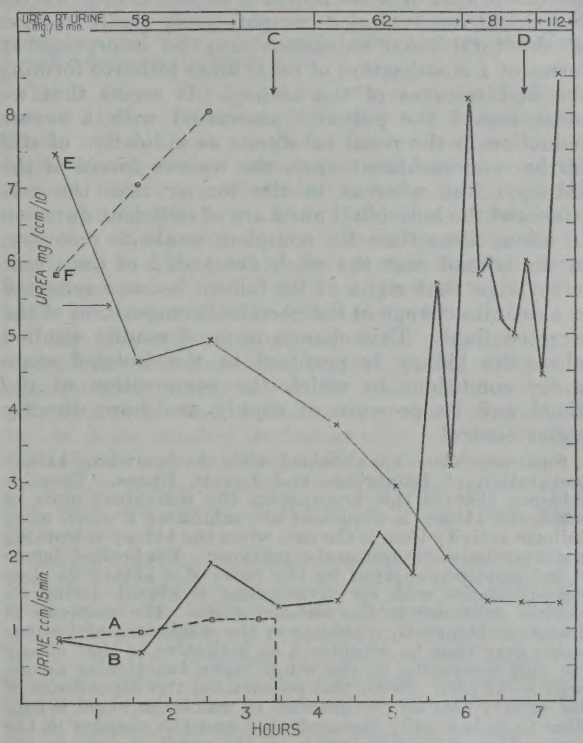
EFFECTS OF REMOVAL OF LARGE AMOUNTS OF RENAL TISSUE IN THE DOG.

So far we have considered the response of the kidney to the functional removal of a relatively small fraction of the total renal substance. We must now attempt to determine whether and, if so, how, the kidney adapts to such a diminution in the amount of tissue that the mobilisation of all the remaining units is by itself unable to cope with the work which it is called upon to perform. In this connexion I should like first of all to refer to some of the fundamental observations which were made by Sir John Rose Bradford in his experimental inquiry into the effects of reducing, by surgical means, the amount of kidney tissue in the dog. It was shown that even when the amount removed was as small as one-eighth to one-quarter of the total, the output of urine was usually increased, but that the removal of larger amounts, ranging up to two-thirds of the total, was followed by a much greater increase in the amount of urinary water.

This increase was not only considerable but also persistent, having been observed, for example, 15 months after the operation. There was no increase in the amount of urea excreted, but a rise was observed in the nitrogenous extractives of the blood and tissues. Such animals were unable to excrete a concentrated urine, and if very large amounts of nitrogenous food were given the urea formed was readily excreted, but only at the expense of a still further increase in the volume of urine. To quote from an original paper: "The cause of the increased excretion of urinary water when the amount of available kidney is thus reduced is by no means clear; it is, however, not associated, as far as my observations have gone, with any very great increase in the general blood pressure." The possibility was suggested, however, that the increase in urea in the blood was the cause of the hydruria.

Using the technique already described, Miss Pickford and I have made a few observations on the unanæsthetised dog to determine whether the polyuria obtained in the experiments of Rose Bradford was reproducible under the somewhat different conditions of our own. In Fig. 3 are given the results of an experiment in which after three and a half hours preliminary observation the left renal artery was suddenly occluded in the unanæsthetised animal. Within the next hour an increase in the rate of urine flow from the right kidney asserts itself, and mounts within the following two hours to a figure nearly three times as great as the sum of the rates of flow from the two kidneys immediately before the circulatory arrest on the left side. The percentage of urea, as will be seen, underwent a profound fall; the amount secreted per unit of time by the right kidney gradually increased towards, but in the interval during which the observations were made did not reach, the rate of urea secretion by the two kidneys in the early part of the experiment. It is probable, therefore, that the urea content of the blood of this animal during the observed polyuric response was

FIG. 3.



A = rate of water elimination by the left kidney; B = that by the right. C = time of ligation of left renal artery. At D 0·5 unit pituitary extract was injected subcutaneously. E = concentration of urea in urine from right kidney; F = that in urine from left.

higher than that before the total renal substance was functionally reduced by ligation of the left renal artery. The results of this experiment would appear to be closely comparable with those described by Rose Bradford, and with those of the experiments of Nature in which the amount of functioning tissue is gradually reduced by the inroads of disease. Here we are observing the gradual development and the initial stages of that polyuria which is the outstanding result of the other two types of experiment. The immediate ætiology of this response is obscure, but there are a few points in this connexion to which attention may be directed. First, the increased urinary flow is not determined by an increased water intake. In the experiment under discussion the animal drank no water during the whole period of observation. And we may correlate with this fact the observation that the increased output of water was not inhibited by the subcutaneous injection of pituitary extract. Indeed, it has been our experience that pituitary extract increases rather than diminishes the polyuric response to experimental reduction in the total renal substance. This absence of an inhibitory

response to pituitary extract is another sign of semblance between this polyuria and that found in certain types of cirrhosis of the kidney. Secondly, it is impossible to say at present whether the polyuria which we are considering is immediately dependent on a maintained change in the composition of the blood supplied to the remaining fragment of renal tissue, or whether it is in part or in whole the result of an interference with a correlation between the two kidneys through the intermediation of the sympathetic nerves. The type of response, however, is similar to that observed when the kidney is subjected to a large increase in the pressure of its arterial blood-supply. We have seen that the response to an increased load of work imposed on the kidney by the functional removal of a comparatively small fraction of the total renal substance may be interpreted in terms of a mobilisation of renal units hitherto forming the first reserves of the kidney. It seems that we must regard the polyuria associated with a severe reduction in the renal substance as indicative of still further encroachment upon the reserve forces of the kidney. But whereas in the former case the rest pauses of the individual units are of sufficient duration to allow them time for complete anabolic recovery, in the second case the work demanded of each unit is so large that signs of its failure become reflected in a definite change in the chemical composition of the secreted fluid. This change is most readily studied when the kidney is perfused in the isolated state under conditions in which the composition of the blood and its pressure of supply are more directly under control.

Such conditions are obtained with the heart-lung-kidney preparation of Bainbridge and Lovatt Evans. There is evidence that in this preparation the individual units of which the kidney is composed are exhibiting a much more uniform activity than is the case when the kidney is working under normal environmental conditions. The limited degree of independence enjoyed by the units of a kidney in close correspondence with its environment is absent during its rootless existence in the isolated state. The response of the whole kidney to a change in the conditions of its perfusion may thus be considered as indicative of that of any one unit composing it, the whole organ functioning as one large renal unit. With this preparation the dependence of the urinary flow on the pressure at which the blood is supplied to it is readily demonstrated and the changes in the composition of the urine when, as the result of a rise in the perfusion pressure, the rate of secretion is increased, determined with ease. Any increase in the pressure stimulus is accompanied by an approach in the composition of the urine to that of the blood plasma, an approach which is to be regarded as a sign of failure to cope adequately with the demand for increased work. And there is evidence that the increment of urine flow produced by an increase in the pressure stimulus is not diminished by the addition of pituitary extract to the circulating blood.

There seems, then, to be sufficient evidence for the tentative association of the polyuria following experimental reduction in the renal substance with a pressure diuresis as seen in the isolated kidney, and for regarding both conditions as the inevitable result of an increased effectiveness of the pressure stimulus. Whether this is tantamount to saying that both are accompanied by an increased rate of filtration through the Malpighian tufts is debatable. All one wishes to emphasise here is the supreme importance of the pressure stimulus, and to point to the changes observed to follow reduction of the renal substance by the experiments of surgery or possibly of disease as being explicable in terms of an increase in this stimulus.

EFFECTS OF LIGATION OF A PRIMARY ARTERIAL BRANCH IN THE ISOLATED KIDNEY.

I should like at this stage to refer to a phenomenon exhibited by the isolated kidney in response to ligation of a primary arterial branch, since it seems possible that it may have some bearing on the polyuria which we are led to regard as the sign of a severe encroachment on the reserves of the kidney.

When the two kidneys of a dog are perfused side by side by means of a heart-lung-preparation the rate and composition of the urine secreted by the one are commonly equal to those of the urine secreted by the other. Moreover, they react by quantitatively equivalent responses to any common change in the conditions of their perfusion. It would be expected from purely anatomical considerations that the ligation of a primary branch of one renal artery would be accompanied by a diminution in blood flow and in urine flow percentually equivalent to the ratio between the infarcted tissue and the whole kidney. If 50 per cent. of the kidney were put out of commission by such means we should expect tha blood flow and the urine flow to suffer a similar diminution, the composition of the urine remaining unchanged when compared with that secreted by the other kidney, which is functioning throughout as a simultaneous control. Experimentally it is found that there is, indeed, a marked fall in the blood flow through the kidney, a fall, moreover, which corresponds accurately with the diminution in the amount of functioning tissue. The urine flow, however, shows no comparable diminution; indeed, quite commonly an absolute increase in its rate is encountered, an increase, moreover, which is immediate in its onset and often progressing as the experiment proceeds.

On arresting the circulation, then, through a part of one kidney perfused in the isolated state, the remaining part, without a moment's hesitation, secretes much more rapidly than before. Analysis of the urine shows that the percentage of urea has suffered a profound fall, whilst the chloride percentage remains steady or, as is commonly the case, shows an actual increase towards the plasma level.

The sequence of events through which the one part of the kidney becomes cognisant of the infarction of the other and immediately responds by secreting urine at a faster rate is by no means clear as yet. It must be a strictly localised one, since no polyuric response is given by the other kidney which is being perfused simultaneously with the same blood. We are able, however, to form a clear idea of the nature of the stimulus to which the non-infarcted region becomes subjected. We mentioned earlier the effects on the rate and composition of the urine of an increase in the pressure at which the blood was supplied to the isolated kidney, and we have just seen the effects of circulatory arrest in the one part of the kidney on the rate and composition of the urine secreted by the other part. The effects are qualitatively and, as has recently been shown, quantitatively identical. The reduced kidney thus responds at constant blood pressure exactly as though it were being subjected to an increase in perfusion pressure, the resultant polyuria being indicative of a dwindling of the functional reserves.

The intimate changes involved in the phenomena which we have so far discussed—viz., the mobilisation of dormant units with or without the subjection of the kidney to an intrinsically developed increase in the pressure stimulus as the result of reducing by experimental means the total mass of renal tissue—are obscure, and the phenomena themselves are of interest in pathology only in so far as they afford a possible parallel with those occurring during, and as the result of, the more gradual reduction which occurs in disease.

MAGNITUDE OF THE PRESSURE STIMULUS.

The physiological experiments to which attention has been directed emphasise the continuous correlation which must exist between the work required of the kidney and the magnitude of the pressure stimulus. On the other hand, we are confronted in health with a maintained constancy in the arterial blood pressure. The peculiar vascular arrangements in the kidney,

however, allow of the possibility of changes in the intraglomerular capillary pressure within wide limits, irrespective of any change in the general arterial blood pressure. Dilatation of the vas afferens with respect to the vas efferens will be accompanied by a rise, dilatation of the vas efferens with respect to the vas afferens by a fall in intraglomerular pressure. The functional reserve of any one renal unit—that is, its capability to perform an increased amount of work—may be limited either by a fall in the magnitude of the pressure stimulus or by a diminution in its effectiveness owing to a fall in the responsiveness of the tubular cells. The stimulus itself may be too small or its translation into effectiveness may be impeded by a diminution in the capacity of the tubule, under an adequate stimulus, to perform work. There are, then, two factors which must be considered in any attempt to assess the functional reserves of the kidney—namely, the magnitude of the pressure stimulus and what may be termed the "tone" of the tubular epithelium. To the latter we shall refer later. Up to the present we have pointed to the increased rate of urine flow which is seen to follow experimental reduction in the renal substance as being explicable in terms of an increase in the pressure stimulus. The degree to which this stimulus can undergo an intrinsic rise is obviously limited by the level of the general arterial blood pressure, and it would be of extreme interest to attempt to discover whether a diminution in the renal tissue to such an extent that the maximal stimulus to the remainder was incapable of producing an adequate response, would be followed by a rise in the general blood pressure.

The existence of a physiological mechanism which might effectively be brought into play in this connexion was demonstrated by Rose Bradford during investigations designed to supply the physiological counterpart of Gaskell's anatomical researches on the involuntary nervous system. It was shown that "stimulation of the anterior roots or of the entire nerve after division of the posterior root . . . was followed by contraction of the kidney and a rise of general blood pressure when any nerve from the sixth dorsal to the second lumbar inclusive was the one selected." Although the excitation of all these nerves produced contraction of the kidney and a rise in blood pressure, yet on the whole stimulation of the lower nerves was more efficacious than stimulation of the upper, the greatest contraction of the kidney being caused by stimulation of the eleventh, twelfth, and thirteenth dorsal nerves. Thus the area from which the kidney vessels are supplied is a very extensive one, and, as was pointed out, it was apparently coextensive with that supplying the abdominal vessels.

It was now found that when such a nerve as the thirteenth dorsal, which with quick rates of stimulation always gave a renal contraction and a rise of general blood pressure, was excited by means of slow rhythmic break shocks of one or two per second, the kidney underwent marked expansion and no change in blood pressure occurred. This true active dilatation of the kidney was only to be obtained by the stimulation of such a comparatively restricted series of nerves as the eleventh, twelfth, and thirteenth dorsal, the same series as that from which the most marked renal vasoconstriction was observed when high rates of stimulation were employed. So far, then, the existence of efferent vasodilator as well as vasoconstrictor nerves to the kidney had been clearly demonstrated, the nerves leaving the cord in the anterior roots of the lower thoracic nerves, passing thence to the splanchnic and so to the renal plexus.

The reflex phenomena of the renal vessels were next investigated, and it was shown that by reflex excitation, be it from the central end of the sciatic or from the central end of an intercostal nerve, it was more common to obtain contraction than expansion of the kidney, but that expansion was frequently obtained by the excitation of the posterior root of a nerve belonging to what may be called the renal area—i.e., the eleventh, twelfth, and thirteenth thoracic.

To quote from an original paper: "If a posterior root below the third lumbar nerve be excited, the rise of blood pressure is similar to that seen on excitation of the great sciatic; if, however, the central end of one of the upper lumbar or lower dorsal posterior roots be excited the rise of blood pressure is far greater in amount and more sudden in its onset; in fact, the effect is quite different from that seen with the lower roots. The anterior roots of these nerves contain, as we have seen, the vasoconstrictor fibres distributed to the vessels of the viscera, and these observations tend to show that these posterior roots also contain special afferent fibres capable of affecting the vasomotor system to a far greater extent than the ordinary afferent fibres seen in sensory nerves. In other words, this great and sudden effect in the blood pressure would tend to show that some posterior roots contain afferent fibres derived probably from the viscera and from the kidney amongst the viscera. The fact that there are such nerves distributed to the kidney and that the excitation of their central ends is capable of causing a very great effect on the vessels of the body generally, is also a fact that may have some bearing on the production of high tension in certain renal diseases. The other point about these afferent visceral fibres is that although their excitation causes a rise of blood pressure with general constriction, there is a local dilatation of the kidney—in fact, this is the only method by which, experimentally, any very considerable dilatation of the renal blood-vessels can be produced."

There is, so far as I am aware, no evidence in favour of the involvement of these reflex phenomena of the renal blood-vessels in the production of the high blood pressure associated with cirrhosis of the kidney, but it is nevertheless a tempting hypothesis to endow the kidney, derived from so extensive a number of segments, with the ultimate power of initiating a reflex rise in the general blood pressure and so of procuring for itself an increase in just that stimulus upon which its activity depends.

With the approach of the blood pressure to its upper limit the functional reserve, in the absence of hypertrophy, which as Rose Bradford showed, in response to removal of one kidney was inappreciable in old dogs, reaches its lowest ebb. A still further diminution in the amount of functioning tissue can now only remain compatible with life in so far as the excretory work of the kidney falls pari passu with it.

Before turning attention to the "tone" of the tubular epithelium as a factor in the functional reserves of the kidney it may be profitable to consider the possibility of renal failure being due essentially to the pressure stimulus being below an adequate level. In experiments with the heart-lung-kidney preparation it has been observed by Dr. F. R. Winton and myself that abnormally large rates of blood flow through the kidney tend to be accompanied by abnormally small productions of urine. One pictures in these cases so large a diminution in the tone of the glomerular vessels that an effective stimulus is hardly brought into being. The renal failure is to be regarded as due to lack of stimulus rather than to any inherent incapacity on the part of the tubule cells. The fall in the resistance of the glomerular bed must be reflected in a rise in the capillary pressure in the intertubular vascular network. Is it possible that such a condition may have some bearing on the oliguria of nephrosis? An observation by Dr. Winton on the isolated kidney of the dog may be not without interest and significance in this connexion. When the two kidneys of a dog are perfused with blood of the same composition by connecting them to a heart-lung preparation, the rate of urine flow from the one may be maintained equal to that from the other by appropriate variations in the perfusion pressure, in the ureter pressure, or in the venous pressure. A low perfusion pressure and normal ureter and venous pressures on the one side may be counterbalanced by a high perfusion pressure and high ureter or venous pressure on the other. But whereas in the former case—that is, when the two kidneys are secreting at equal rates, the one being under the influence of a low blood pressure, the

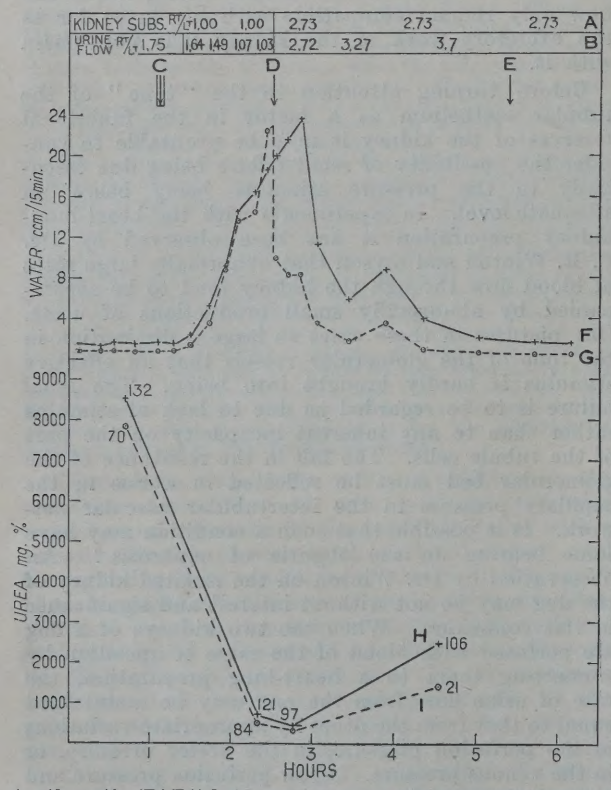
other of a high arterial pressure and high ureter pressure—the compositions of the two urines are, as far as has been determined, identical, in the latter case, that is, when a rise in venous pressure is substituted for a rise in ureter pressure, the equality of chemical composition is maintained with the important exception that protein makes its appearance in the urine. And over short periods of time the changes responsible for its appearance are completely reversible. Gross alterations, then, of the mechanical conditions under which the kidney is working do not influence the fundamental processes involved in the preparation of the urine, the non-colloidal composition of this being a function solely of the rate at which it appears. And the appearance of protein is not incompatible with the sustained integrity of these fundamental processes. A fall in the tone of the glomerular vessels with a consequent rise in the intertubular capillary pressure may conceivably be a factor in initiating the oliguria and proteinuria of that collection of signs which we associate in the term nephrosis.

"TONE" OF THE SECRETORY EPITHELIUM.

Up to the present we have considered the responses of the kidney to the putting out of commission of a portion of its substance, and we have seen that these responses are possibly explicable in terms of an increased pressure stimulus to the remainder. The diuretic response, then, must be regarded as being essentially reversible and truly physiological in its nature. The increased urine production by the remaining units with their partial failure as manifested by an approach in the composition of the urine to that of the plasma, may be compared with the physiological and reversible dilatation of the heart which occurs during exercise. And just as a pathological impairment in the capacity of heart muscle to perform a given amount of work is reflected in a dilatation of the heart more or less permanent in its nature, so in the case of the kidney a pathological impairment in the capacity of the tubular epithelium to perform work under an otherwise adequate stimulus is reflected in an approach in the composition of the urine to that of the plasma, a diuresis more or less permanent in its nature. Physiological dilatation of the heart and physiological diuresis are to be regarded as due primarily to an increased stimulus, pathological dilatation of the heart and pathological diuresis to a diminished efficiency of the heart muscle and tubular epithelium respectively. Arguing from analogy we should expect that for a given rate of urine production by renal units working under these two conditions there would be a wider divergence in the chemical work performed than in the oxygen consumed by them. The "tone" of the one is higher than the "tone" of the other. And it would appear that the responses of one part of the tubular epithelium to changes in the composition of the blood are not affected by the functional removal of the other part. The following two experiments demonstrate this when the applied stimuli are respectively the giving of water by the mouth and of urea intravenously.

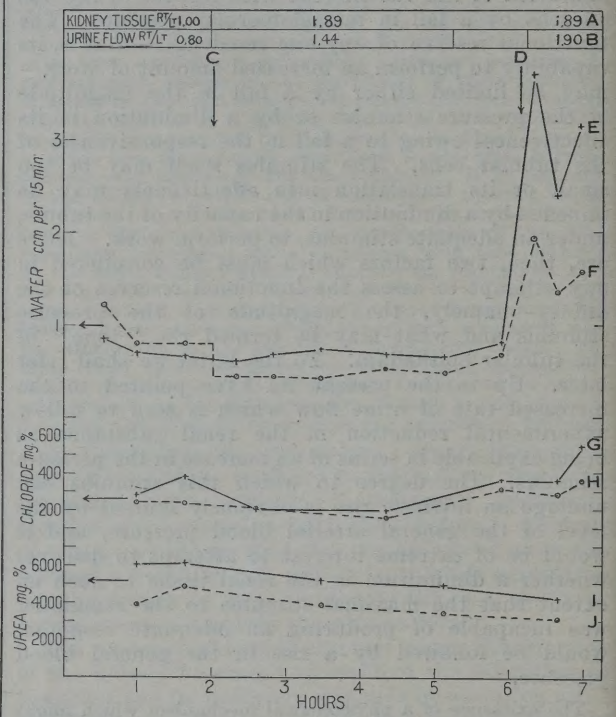
In the experiment illustrated in Fig. 4 it will be seen that the right kidney was secreting more rapidly than the left—

FIG. 4.



A = the ratio (Rt/Lt) between the amounts of functioning renal tissue in the two kidneys. B = the ratio (Rt/Lt) between the rates of urine secretion by the two kidneys. C = time of administration of 250 c.cm. water by stomach-tube. D = time of ligation of posterior branch of left renal artery. F = rate of urine flow from right kidney; G = that from left. H = concentration of urea in urine from right kidney; I = that in urine from left. The figures on the urea graphs have the same significance as in Fig. 2 (q.v.).

FIG. 5.



A, B have same significance as in Fig. 5 q.v. C = time of ligation of posterior branch of left renal artery. D = time of injection of 2 g. urea intravenously. E = rate of water elimination by right kidney; F = that by left. G = concentration of chloride (as NaCl) in urine from right kidney; H = that in urine from left kidney. I = concentration of urea in urine from right kidney; J = that in urine from left kidney.

namely, one and three quarter times. During the interval marked C 250 c.cm. of warm tap water were given to the dog through a stomach-tube. As the polyuria develops it will be observed that the ratio between the right and left rates of urine flow gradually approaches unity. At D 64 per cent. of the left renal substance was functionally removed by ligating the posterior branch of the left renal artery by the method already described. The urine flow on the left side falls in the same proportion, and as the water diuresis passes away the ratio between the right and left rates of urine flow per unit of kidney substance increases towards the value it held before the giving of the water. It would, of course, be of great theoretical interest and importance to know how the rates of blood flow through the two kidneys varied during such an experiment as this, but such information is not forthcoming.

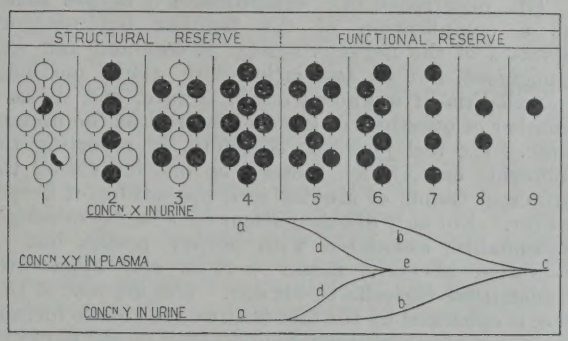
In Fig. 5 we see the results of an experiment in which urea was injected intravenously some time after part of the left kidney had been put out of commission. Ligation of the posterior branch of the left renal artery at C, thereby arresting the circulation through 47 per cent. of the kidney, gave in this experiment an almost proportional drop in urine flow as is seen from the constancy of the relation between the two ratios given at the head of the figure. At D 2 g. of urea in 10 c.cm. Sydney Ringer's fluid were injected intravenously. As the result of this the rates of urine flow now became directly proportional to the masses of tissue functioning in the right and left kidney, the original inequality in these ratios having disappeared.

Again, it would seem from studies on the isolated kidney that the relative or absolute increase in urine flow which we have described as resulting from ligation of a primary branch of the renal artery is itself unaffected by the addition of pituitary extract to the blood. The inhibition of the rate of urine flow which follows the addition of this extract is probably directly proportional to the amount of tissue functioning and not to the rate of urine elimination. A physiological diuresis brought into play through an increase in the pressure stimulus has, then, possibly very little or even no influence on the responses of the tubule cells to changes in the composition of the blood bathing them. A pathological diuresis, however, is, as we know, often accompanied by a profound diminution in these responses, the fall in the tone of the tubular epithelium being reflected not only in an increased flow of urine but also in a lack of correspondence between this epithelium and its environment, both of which are signs of a fallen reserve.

How far, if at all, the effects of this fall in the tone of the tubular epithelium which we conceive to be present in nephritis associated with polyuria may be comparable with the approach in the composition of the urine towards that of the plasma which occurs when the oxygen-supply to the kidney is experimentally reduced, or when the organ is subjected to small concentrations of cyanide, we cannot say. Prolonged constriction of the vasa efferentia might conceivably be an ætiological factor in its production, the polyuria being the summated result of the rise in intraglomerular pressure and reduced oxygen-supply to the tubules. And whether such a change varying in its intensity and duration throughout the multitude of glomerulotubular units could itself produce the functional derangements found in disease is a problem which only research in the future can show.

I have attempted in Fig. 6 to illustrate the calling into play and the progressive diminution in the reserve forces to which attention has been directed in this paper. In the column marked 2 are represented ten glomerulotubular units, four being active and six inactive. The term inactive is used in the sense that no urine is being secreted by this unit and not in the sense that no blood is flowing through its glomerulus. An increase in the work demanded of the kidney or a diminution in the mass of renal tissue is followed by an increased density of active unit in the functioning tissue, this increased density being represented in columns 3 and 4, and, as shown, reaching saturation in this last stage. During this progressive mobilisation of the structural reserves the composition of the urine would undergo essentially no very great change, as is indicated in the figure. A further increase in the work demanded of the kidney, or a further diminution in the mass of functioning tissue, can now be accomplished only through an incursion into the functional reserves,

FIG. 6.



For description see text.

the work done by each unit being greater than before. This is accomplished apparently by a rise in the magnitude of the pressure stimulus, and if the efficiency of this increment of work were sufficiently high the composition of the urine would remain still essentially unchanged. This state of affairs is represented in stage 5. A further reduction in the parenchyma of the kidney raises the pressure stimulus to the remainder still higher and secretion by each unit is now so rapid that the composition of the urine turns towards that of the plasma. This movement in composition towards the plasma will occur early or late according to the degree of tone of the tubular epithelium. Whereas in experimental reduction of the renal substance the mobilisation of the structural and functional reserves will be reflected in a late approach in the composition of the urine towards that of the plasma, in pathological reduction the mobilisation will be reflected in an early approach. The relative times of this approach are represented in the figure by the curves *a*, *b*, *c*, and *a*, *d*, *e*, respectively.

In the column marked 1 is depicted the state in the isolated kidney when the tone of the glomerular vessels is abnormally low, a state which, as previously suggested, may have some bearing on the condition of the vascular bed in nephrosis.

A BIRMINGHAM CONVALESCENT HOME.—The Birmingham Hospital Saturday Fund has purchased a site for a new convalescent home for women near Weston-super-Mare. At present 400 women are awaiting their turn to go to the two existing homes, some of whom cannot be accepted for two months. The new building will contain 100 beds.

A HOSPITAL MOTOR SERVICE.—The Merseyside Hospitals Council is organising a night transport service for taking relatives and blood transfusionists to the Liverpool hospitals in cases of urgency. Motorists who are on the telephone are being asked to hold themselves in readiness, each for one month in the year, to be rung up at any time during the night. Last year 100 transfusions were performed at the Liverpool hospitals, and some 1500 patients became dangerously ill during the hours when ordinary transport is not available.

ACUTE MENINGO-ENCEPHALITIS ASSOCIATED WITH HERPES ZOSTER.

A FATAL CASE.

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THE occurrence of "symptomatic" herpes zoster as a complication of the familiar inflammatory diseases of the nervous system is common and well recognised, but its association with acute meningo-encephalitis of unknown origin is rare, and raises a number of questions of unusual interest at the present time. We feel justified, therefore, in reporting the following case, which focuses in one individual the principal trends of inquiry into the nature of herpes zoster. Not only did the patient die of acute meningo-encephalitis associated with herpes zoster, but he exhibited aberrant zoster vesicles and apparently transmitted varicella to his son. The interest of this case is enhanced by the fact that we are able to include the result of complement-fixation tests on the patient's cerebro-spinal fluid carried out by Dr. S. P. Bedson and Dr. J. O. W. Bland.

Report of a Case.

A. B., a Hebrew, aged 67, was a corpulent man who had previously enjoyed good health. On August 10th, 1929, he began to complain of headache. Two days later he developed severe pain over the right lower jaw and half way down the right side of the neck. On August 14th a typical herpetic rash with large vesicles appeared in the painful area. Vesicles were present on the right side over the lower jaw, the upper half of the neck, the auricle, and the occipital region of the scalp. His temperature and pulse were normal. The patient now became drowsy and mentally confused. He was disorientated, and at times struggled to get out of bed. During the following two days the rash became pustular, and a similar pustule appeared on the abdominal wall.

On August 18th he was drowsy, and when roused to answer questions he was confused and disorientated. There was moderate cervical rigidity. The fundi were normal, and the pupils reacted briskly to light and on accommodation. There was bilateral ptosis and weakness of conjugate ocular deviation to the right. Otherwise the ocular movements were full, and squint and nystagmus were absent. There was slight weakness of the lower part of the face on the right side, and the tongue deviated to the right on protrusion. There was slight weakness of the right upper limb, but in the other limbs power was normal and there was no incoördination. The tendon jerks in the upper limbs were brisker on the right side than on the left. The knee- and ankle-jerks and the abdominal reflexes were not elicited, and the plantar reflexes were flexor. The only sensory abnormality was a zone of hyperalgesia corresponding to the cutaneous distribution of the second cervical spinal segment on the right side. There was no sphincter disturbance. Kernig's sign was absent. There were signs of bronchitis.

On August 18th the patient was admitted to the London Hospital, and on the 19th lumbar puncture was performed. The spinal fluid appeared to be under increased pressure, and 32 c.cm. were withdrawn. There were 120 mononuclear cells per c.mm.; protein, 0·06 per cent.; chlorides, 0·73 per cent. The fluid was sterile on culture and the Wassermann reaction was negative.

The patient remained in the London Hospital for ten days. During this time five new pustules appeared, widely scattered, on his back, and a purpuric rash on both knees. At first noisy and restless, he gradually lapsed into coma, but developed no fresh signs of involvement of the nervous system. His temperature did not rise above 99·4° F., nor his pulse above 100. Signs of broncho-pneumonia appeared and, at the request of his friends, on August 28th he returned home where he died on the 31st. There was no autopsy.

Two or three days before the patient's death his son, aged 32, who did not live in the same house but was in frequent contact with his father, developed a severe attack of varicella. His temperature reached 103° F., and he was acutely ill, but the attack subsided without any complications.

COMPLEMENT-FIXATION TESTS.

Bedson and Bland [1] have reported the results of complement-fixation tests in which the cerebro-spinal fluid of our patient was used as an antigen against the blood sera of two patients convalescent from herpes zoster and two normal sera. They first showed that fixation of complement occurred when three zoster convalescent sera were put up against two zoster vesicle fluids as antigens, while two normal sera gave negative results. Two of the convalescent sera gave fixation also with a third zoster vesicle fluid. These two sera were then used with the spinal fluid from our patient and with that from a case of encephalitis complicating diphtheria.

"The two zoster convalescent sera, 'X' and 'Y,' both gave fixation—weakly positive it is true—with the zoster encephalitis C.S.F., but no fixation with the other specimen. The two normal sera failed to give fixation with either. This finding appears to us significant, and suggests the possibility of using the test in the elucidation of the ætiology of encephalomyelitis." (Bedson and Bland.)

Other Recorded Cases.

Chauffard and Froin [2] were among the first to draw attention to the evidence for the occurrence of meningitis in cases of herpes zoster. They attributed the lymphocytosis in the spinal fluid in a case of ophthalmic zoster to an extension to the arachnoid of the inflammation arising in the gasserian ganglion. In 1907 Chauffard and Rendu [3] described another case of ophthalmic zoster in which the clinical features of meningitis, headache, cervical rigidity, and bradycardia were also present. They described the condition as "méningite zonateuse," and alluded to a case of thoracico-abdominal zoster in which Kernig's sign was present. Proust [10] reviewed the question of "la réaction méningée" in ophthalmic zoster. Souques [13] described a case of encephalitis lethargica in which herpes zoster developed eight months after the onset of the illness. Renon and Blamoutier [12] reported a case of anal zoster preceded by meningeal symptoms in the sacral region. Netter, who has made a special study of herpes zoster, reported a case of zoster associated with encephalitis in 1920[7] and had collected four further cases in 1922.[8] Netter's case 1 was a man of 33 who, nine days after the onset of intercostal zoster, developed myoclonus of the muscles of the abdominal wall, lumbar region, and buttocks. This symptom disappeared in a fortnight. A diagnosis of the myoclonic form of encephalitis lethargica was made, although it was admitted that the patient exhibited neither somnolence nor ocular symptoms. In case 2, a child, myoclonus of the upper limbs, cervical rigidity and slight unilateral ptosis coincided with an eruption of zoster on the right side of the chest and the proximal part of the right upper limb. Recovery occurred in a fortnight. Case 3 is briefly reported as encephalitis associated with ophthalmic zoster. Case 4 is that reported by Souques and already described. Case 5 was a girl of eight who became acutely ill with epileptiform convulsions, stupor, blindness, right hemiplegia and aphasia, cervical rigidity and Kernig's sign. The cerebro-spinal fluid was normal. This child developed herpes zoster on the right buttock 12 days after the onset of her illness. The patient made a partial recovery but died six months later of streptococcal meningitis. Her original illness was diagnosed as encephalitis lethargica. It is interesting that another patient in the same ward developed varicella 12 days after the outbreak of herpes zoster.

Tilney and Howe [15] described a case of encephalitis lethargica, characterised by weakness and lethargy blurred vision and diplopia, in which, three weeks after the onset, an atypical herpetiform eruption developed in the distribution of the left trigeminal nerve. Madsen [6] described the supervention of intercostal zoster five months after the onset of encephalitis lethargica.

Ramond [11] quoted two cases of meningitis complicating zoster in addition to those reported by Chauffard. Eschbach described a severe generalised meningitis developing on the sixth day after the appearance of thoracic zoster. Sicard reported a similar occurrence after ophthalmic zoster. Thalhimer [14] described a fatal case which bears some resemblance to our own and in which autopsy was obtained. His patient, a woman of 72, developed zoster in the right cervical region from the hair line to the clavicle. She died six weeks after the onset, having been drowsy for one week before death, but having shown no abnormal physical signs in the nervous system. Histological examination revealed perivascular infiltration of the nervous system with round cells and similar infiltration of the pia mater from the cervical cord up to the internal capsule. Gundersen [4] described a man aged 53 in whom herpes zoster in the lumbar region was associated with a generalised varicellar rash, paroxysmal hiccup, somnolence, cervical rigidity, myoclonia, athetosis, general paræsthesiæ, and parotitis.

Nature of the Association.

Clinical observation early divided cases of herpes zoster into two groups, "symptomatic" and "idiopathic." In the former the zoster arose subsequently to an injury, infection, or intoxication. In this group were placed the cases of zoster complicating spinal injury and tumour, syphilis of the nervous system, meningococcal meningitis, carbon monoxide poisoning and the therapeutic use of arsenic and bismuth. In "idiopathic" zoster no such predisposing cause could be found. This distinction between symptomatic and idiopathic zoster remains clinically important, but recent investigations have shown that there is no essential difference between the two conditions.[9] In both cases the histological changes in the spinal cord and ganglia are identical, and both may lead to varicella in contacts. Further, the occurrence of epidemics of zoster, the presence of inflammatory changes in the spinal cord and ganglia, the transmission of varicella from zoster and vice versa, and the presence of specific antibodies in the blood of zoster patients all support the view put forward 30 years ago by Head and Campbell,[5] that herpes zoster is a specific infection, with a predilection for the first sensory neurone. Injury to this neurone predisposes to the development of zoster ("symptomatic") which, however, may arise spontaneously ("idiopathic").

There are three possible explanations of the association of zoster and meningo-encephalitis. (1) It may be a coincidence. (2) A pre-existing meningo-encephalitis, by damaging the first sensory neurone, may lead to an outbreak of "symptomatic" zoster. (3) The virus of herpes zoster itself may by extension cause meningo-encephalitis. A review of the literature suggests that all three possibilities may be realised. Souques considered that in his case the occurrence of zoster eight months after the onset of encephalitis lethargica was a coincidence, though a "symptomatic" zoster cannot be excluded. The relationship between the encephalitis and the zoster is equally doubtful in Madsen's case in which the interval between them was five months. The remaining reported cases fall into two groups, (1) those in which the meningo-encephalitis preceded the zoster, and (2) those in which the reverse occurred. Netter's case 5 and Tilney and Howe's case fall into the former group, and should probably be regarded as "symptomatic" zoster. In the other cases, including our own, there was no evidence of any infection of the nervous system preceding the zoster. Certain clinical features emerge from a consideration of these cases. (1) Meningeal symptoms are prominent. (2) These often possess a local predominance corresponding to the situation of the zoster. Ramond points out that headache and cervical rigidity are associated with ophthalmic zoster, and Kernig's sign with a thoracico-lumbar distribution. Renon and Blamoutier's case further illustrates this point. (3) Myoclonus was present in Netter's cases 1 and 2, and in Gundersen's patient.

The evidence points to the occurrence of meningo-encephalitis and meningomyelitis due to the virus of herpes zoster. This view is supported by the following facts. There is reason to regard herpes zoster as an infective disease produced by a neurotropic virus. Although this virus primarily attacks the posterior horns and posterior root ganglia, extension of the inflammation to the meninges is indicated by the frequent occurrence of lymphocytosis in the spinal fluid in the absence of signs and symptoms of meningitis. In rare cases the latter may also be present, either localised to the region affected, or in a generalised form, their onset following several days after the first symptoms of the zoster.

Bedson and Bland's interesting observations are not conclusive proof that in our patient the meningo-encephalitis was due to the virus of zoster, for we have no evidence that this virus may not be present in the spinal fluid when "symptomatic" zoster complicates a meningo-encephalitis of other, but unknown, ætiology. Nevertheless, for the reasons given, we prefer the simpler and more natural view that the zoster virus was responsible for the whole chain of events.

We cannot here discuss the question of the relationship between zoster and varicella, raised once again by the cases of our patient and his son. But we may remark in passing that if varicella is closely related to the neurotropic virus of zoster it seems superfluous to look for some secondary invader to account for varicellar encephalitis and myelitis. These difficult matters well demonstrate the inadequacy of clinical pathological, and even bacteriological criteria for the distinction of what we described as "diseases," and indicate the need for a more dynamic and biological conception of an infective disease as the reaction of the individual to the causative organism.

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SURGICAL TREATMENT OF ADHESIONS INTERFERING WITH ARTIFICIAL PNEUMOTHORAX.*

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(WITH ILLUSTRATIVE PLATE.)

Forlanini first recognised the prejudicial effect of pleuritic adhesions in artificial pneumothorax, and Gravesen and Matson independently noted that permanent cure was obtained in some 37 per cent. fewer cases with adhesions than in cases with complete collapse. Since the majority of adhesions are due to perifocal inflammation of superficial foci in the lungs, it is not astonishing that the pulmonary insertions of the adhesions are often directly over the walls of cavities. The bad effect of pleuritic adhesions being indisputable, from the very beginning of the pneumothorax treatment, many attempts have been made to deal with them, but with little success. The service Jacobaeus rendered to science when he devised his successful method in 1910 cannot, therefore, be too highly praised; indeed it is still very popular though it has many opponents. He uses a thoracoscope, similar in construction to a cystoscope. He anæsthetises an intercostal space and pushes a trocar with the cannula for the thoracoscope gently through the chest wall. By manœuvring the instrument in all possible directions, he examines the thoracic space and the shape, length, and thickness of adhesions —in short their operability. With the thoracoscope to guide, the galvanocautery is introduced in the same manner through a second cannula and is placed on the adhesion; the cautery is brought to a cherry-red glow, and the division is then made.

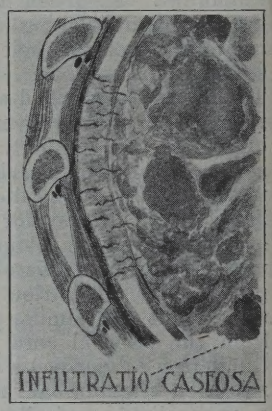
With this method a considerable improvement may be expected in 66 per cent. of cases. The most serious complication is empyema. According to the statistics of Jacobaeus and Unverricht, empyema must be reckoned with in 10 per cent., and tuberculous exudate in 15 per cent. of cases. It is well known that purulent exudate is a very serious if not a fatal complication. Although two-thirds of the cases can apparently be successfully dealt with, they have not the absolute guarantee but only the prospect of a permanent cure. The question, therefore, must be raised whether an extrapleural thoracoplasty would not be more favourable than an insufficient pneumothorax.

A Classification of Adhesions.

Empyema may arise from different causes; absolute sterility is rendered difficult by the thoracoscopy, and suppurative organisms may be brought into the pleural cavity by the operator himself; the eye-lashes of the face may touch the thoracoscopic eye-piece, and the operating hand may be contaminated while directing the instrument. However, realisation of these dangers should be a sufficient guarantee against exogenous empyema from such causes.

When we inquire into the origin of endogenous empyemata we must realise that the adhesions are not always truly fibrotic. Histological examination of 37 strands and membranes has convinced me that nearly three-quarters of the attackable adhesions contain lung tissue, and to this fact we must attribute the cause of the appalling percentage of empyemata. Since the majority of the adhesions are due to perifocal inflammation of superficial exudative or destructive foci in the lung, the parenchyma loses its vitality and is drawn out into a pedicle when pneumothorax is induced. Between the two extremes, on the one hand, a purely fibrotic adhesion, and on the other hand one which consists solely of parenchyma, there are all degrees of variation. Further histological investigation has shown that the pulling action of the adhesion and the weight of the lung can cause a tent-like projection of the parietal pleura. The majority of the larger adhesions, therefore, show the following threefold structure: firstly, parietal pleura with fascia endothoracica; secondly, the fibrotic bridge—that is to say, the symphysis between the two parietes; thirdly, the lung pedicle. (Fig. A.)

FIG. A.



Showing the threefold structure of the larger adhesion.

The shape of the individual adhesions gives such a definite indication of their structure that I have chosen it as the basis of a classification, which is of the utmost practical value, particularly in cases where, in consequence of a pleurisy, the pneumothoracic cavity is the same colour all over, so that neither parenchyma nor connective tissue can clearly be distinguished. As a basis indicating the advisability of operation we can, however, rely on the following classification:—

1. Adhesions of which neither the pulmonary nor the thoracic insertion is broadened out. They are the result of intrapleural symphysis occurring shortly before the induction of the pneumothorax. Their elasticity is very great and in consequence they stretch easily and almost without limit. Their division is not dangerous but its therapeutic effect is more or less illusory.

2. Adhesions of which the thoracic end is broadened out. In this class the symphysis is older, and has become fibrotic; its elasticity is therefore limited. The parietal pleura is projected in a tent-like manner. The therapeutic result of division is certainly better, but one very seldom comes across this type of adhesion.

3. Adhesions of which the pulmonary insertion is conical. In this case the pleuritic symphysis, owing to its long standing, is very dense. In consequence of exudative and destructive foci, the lung has little vitality, and is drawn out by the pulling action of the adhesion into a veritable pedicle. Rist and Brauer have published similar cases. This type is frequently met with and the majority of the empyemata are due to division of adhesions of this class. On the other hand, if no complications result, the best therapeutic effect can be attained with this class of adhesion.

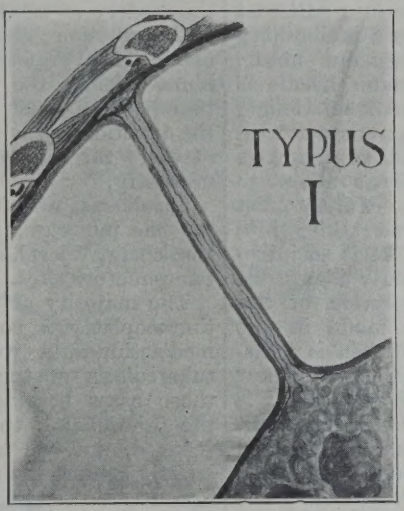
4. Adhesions of which both the thoracic and the pulmonary insertions are expanded, like an hour-glass. Between the tent-like projection of the parietal pleura and the pulmonary insertion the fibrotic bridge of the old pleuritic symphysis is to be found. The danger of endogenous infection is less than with type 3. The most important adhesions belong to this type.

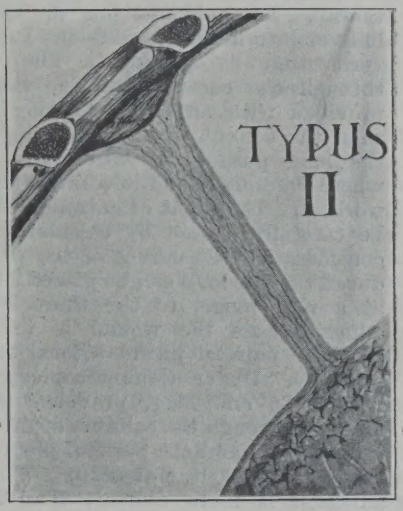
* A paper read before the Medical Society of London on Feb. 10th (see THE LANCET, Feb. 15th, p. 355).

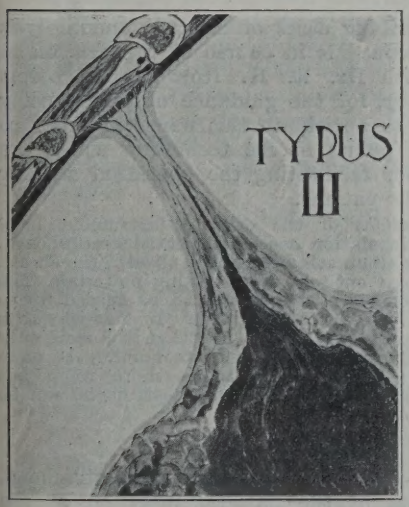
Necessity for "Enucleating" Adhesions.

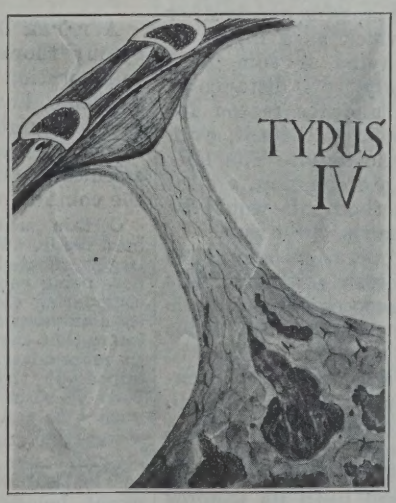
The thicker the adhesion the shorter and more serious it becomes, and the nearer the parenchyma approaches the chest wall. The operator therefore finds himself faced with the alternative of attacking only long drawn-out strings, which are only exceptionally a cause of the failure of the pneumothorax, or of running the risk of opening the bronchial system or even cavities in cutting thick and short adhesions. Jacobaeus, Unverricht, and others have pointed out the necessity of dividing adhesions as near as possible to their thoracic insertion. Their statistics support my assertion that this is not sufficient. "Division of adhesions," the technical term for the operation, is a term which itself implies an unskilful procedure. It is absolutely necessary to enucleate adhesions from the chest wall. With rare exceptions they consist in this situation solely of connective tissue and with this modus operandi only one lung stump results, together with a wound in the thoracic wall. Enucleation of the adhesion from the chest wall is possible neither with the instrument of Jacobaeus nor with its modifications. The insertions are generally well vascularised and there is a still greater danger, that of injuring an intercostal vessel. This complication is all the more dangerous, because in serious hæmorrhage, the thoracic cavity has to be widely opened for the ligature of the bleeding vessel. But even a small hæmorrhage has its importance in the ætiology of empyema. In consequence of this many attempts have been made to replace the galvanocautery by cutting diathermy, for instance by Hervé and by Maendel and Kornitzer, who have provided their instrument with a galvanocautery in order entirely to cauterise those adhesions which they are not able to divide with the cutting diathermy. This accessory instrument is not necessary, seeing that modern apparatus have been constructed which divide dense strands without difficulty. On the other hand, I cannot too forcibly point out the disadvantages of cutting diathermy. This method needs a current of such a strength that it is capable of causing deep coagulation. To illustrate this, take the case of a short adhesion. Even by working the cutting diathermy as near as possible to the chest wall one cannot prevent the lung pedicle as well as the line of division from becoming partly white. This portion of coagulated lung later on becomes necrotic and empyema results.

THE FOUR TYPES OF INDIVIDUAL ADHESION.









I worked out in 1927 and published in 1928 a method of my own.[1] I work with high-frequency currents of 0·1 to 0·3 ampère, just enough to produce a coagulation zone 2–3 mm. wide. I thus sacrifice all cutting effect in order to obtain a small and sharply defined coagulation area on the parietal pleura, close around the thoracic insertion. For the cauterisation the loop of the cautery is kept in the middle of this narrow coagulation zone. For very expanded insertions, diathermy and galvanic current have to be used alternately until the adhesion is completely enucleated. By this method all hæmorrhages can be avoided, the small current coagulating even intercostal vessels and, above all, no risk of wounding the lung is incurred. With my method I can considerably reduce the danger of subsequent empyema and enlarge the field of cases where operation is indicated. Of 130 cases operated upon, one developed empyema and another a tuberculous exudate. No patient died, either from direct or indirect causes. I cannot give you better proof of the efficacy of this method than these statistics. (See Plate, Figs. I. and II.)

[1] Brauers Beiträge, 1928, lxix., 246.

Author's Technique.

I introduce the thoracoscope at a point where the best view of the adhesion can be obtained. For apical adhesions the instrument is introduced in the nipple line, but it is seldom used behind in the interscapular region, where radiological exploration leaves us in the dark as to the dimensions of the pneumothorax. To avoid plunging the trocar into adherent lung or into invisible adhesions I make a preliminary verification by passing a fine Saugmann needle through the chest wall. The Saugmann needle is provided with an easily slipping wire 2 cm. longer than the cannula itself. The slightest contact with the lung pushes the wire back, and so indicates where the lung is and how much space is available to work in. The point of entrance of the cautery must be carefully chosen by calculating and taking into consideration the curves of the ribs. It is so introduced that its loop can be placed as nearly as possible at a right angle to the thoracic insertion of the adhesion. As the wound is to be made in the sensitive parietal pleura a local anæsthesia is indispensable. Under thoracoscopic guidance a hollow needle, 25 cm. long, provided with a syringe, is directed through the cannula of the cautery, and both the adhesion and the parietal pleura are anæsthetised with 0·4 per cent. novocain. The enucleation of an adhesion is more difficult than its division. The instrument used for this work of precision must therefore be light and at the same time stable, and must slide easily in the cannula. To facilitate the alternative use of the two currents I have constructed a combined cautery, the galvanocautery loop acting also as the therapeutic diathermy electrode. The electricity supply is regulated by a foot control with pedal switches on opposite sides, so that the hand directing the cautery does not lose its balance. By means of this apparatus I am able to deal with big and short membranes as thick as a finger, situated one behind the other, or adhesions crossing one another or with rope-like adhesions as thick as a humerus. In such adhesions the parenchyma is sometimes separated from the chest wall only by a distance of some millimetres, which is yet another reason for working practically on the thoracic wall itself, even at the risk of damaging the periosteum. The long thin adhesions of type 1, which are common, are, of course, divided by the usual method; it would be superfluous to enucleate them from the chest wall.

The field of indication for the operation being thus extended I continually come across veritable walls of short adhesions. With the thoracoscope we only see in one direction and consequently only get one surface into the visual field. We have, therefore, always to bear in mind that behind the adhesions the parenchyma may be directly in contact with the chest wall.

In order to avoid burning into the lung or into a cavity I have constructed a sound of the diameter of the cautery, which slides easily into the cannula. The instrument is pushed forward until its window touches the free border of the membrane, the cross-beam with which it is furnished is placed on the invisible wall of the adhesion and, by carefully retracting the instrument, an approximate idea of the thickness of the invisible part can be obtained.

I was interested to read in THE LANCET of Feb. 1st an article by Dr. F. G. Chandler, who has adopted the principles of my method, which I am convinced is the best method of burning adhesions. He differs from me inasmuch as his instrument contains thoracoscope, coagulating electrode, and cautery in one, resembling in construction those of Maendel and Kornitzer but having several advantages. Personally, I find it preferable to work with two punctures. The introduction of the trocars is, after all, the simplest and easiest part of the operation. The enucleation of the adhesion can be done more precisely with a straight and stable cautery, which slides easily into its cannula and which is quite independent of the thoracoscope in its movements. It is necessary to place the loop of the cautery at right angles to the thoracic insertion of the adhesion; this cannot be done with the guidance of the X ray pictures only, even with stereoscopic films. Before the introduction of the cautery the thoracoscope must be introduced in order to study the direction of the adhesion and to find the best point of entry for the cautery, and so two punctures are necessary.

Jacobaeus, who in 1924 made various attempts to use one puncture, shares my opinion, and Frisch, Eiselsberg, Wiegel, and Kremer have all gone back to two-puncture sites.

The majority of difficult divisions are cases where thoracoplasty is counterindicated owing to a weak mediastinum, a weakness of the myocardium, or tuberculosis of the other lung. The operation in those cases becomes decisive and life saving. On the other hand, the complications are considerably reduced, and we have, therefore, no reason to be strictly against the performance of the operation.

THORACOSCOPY AND INTERNAL PNEUMOLYSIS.

POINTS IN TECHNIQUE.

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A PAPER describing cases of internal pneumolysis by my thoracoscope[1] is in course of preparation in collaboration with Dr. R. H. Howells. It seems desirable, however, for the guidance of others using this instrument to anticipate this paper in order to describe certain points in the technique which are essential, both for facilitating the operation and for the comfort of the patient.

Certain *modifications* of the original instrument have been made. The insulation has been greatly strengthened, largely effected by eliminating the metal sheath, the sheath now being composed entirely of insulating material. The coagulating electrode is now intended to be turned up to its maximum and used in this position. In this way it is found that the illumination is best, and that it is more easy to manipulate. Further, realising that mobility is more important than absolute air-tightness, more room has been given in the cannula so that the instrument can be pushed to and fro easily.

Localisation.

The thoracoscope, being a one-puncture instrument, exact localisation of the parietal insertion of the adhesion is essential, for often it is at the parietal end, if not actually on the chest wall, that the adhesion must be divided. The decision in what interspace to insert the cannula, and whether to go into the front of the chest or the back, or the axilla, must depend entirely on this localisation. If a mistake is made or if a wrong point of entry is chosen the instrument may not touch the parietal end of the adhesion, or will do so only with difficulty and much pressure of the cannula on the patient's chest; or it will be

[1] THE LANCET, 1930, i., 232.

found that there is not sufficient room in which to work and there is danger of withdrawing the thoracoscope too much so that "shorting" takes place between the instrument and the cannula. This localisation is achieved by a study of the skiagram and by screening the patient. The horizontal plane of the insertion can usually be determined without difficulty. What cannot be learned from the skiagram is whether the adhesion is inserted anteriorly or posteriorly to the midaxillary line. This can be determined by rotating the patient during screening. If the adhesion appears shorter whichever way the patient is rotated, the adhesion must be inserted in the midaxillary line.

If an adhesion in the right pleural cavity is inserted anteriorly to the midaxillary line (Fig. 1, A), and the patient

FIG. 1.

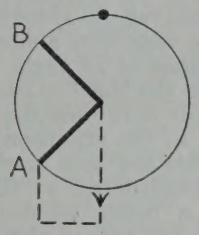
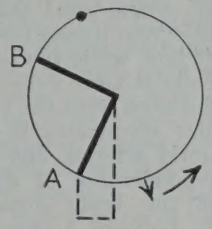


FIG. 2.



is rotated to the right oblique position (Fig. 2), the adhesion will appear to become shorter; if it is inserted posteriorly to the midaxillary line a similar rotation will make it appear to become longer. If the patient is rotated to the left oblique position, the reverse will occur. Contrariwise, if an adhesion in the left pleural cavity is inserted anteriorly to the midaxillary line and the patient is rotated to the right oblique position, it will appear to become longer, if posterior to the midaxillary line it will appear to become shorter as a diagram similar to the above, made on paper, will readily show. If the patient is rotated to the left oblique position the reverse again will occur. We are, therefore, able to say whether an adhesion is inserted anteriorly or posteriorly to the midaxillary line. If the adhesion cannot be seen on screening skiagrams can be taken in these positions.

Localisation having been determined, a position is selected on an actual skeleton which would be the optimum point of approach for the instrument, remembering that it is not safe to go nearer than one inch to the sternal border or nearer than one inch to the border of the spine. At Victoria Park Chest Hospital, thanks to Dr. J. V. Spark's most valuable coöperation, we have found this method most successful.

Anæsthesia.

Local anæsthesia, from within, of the part to be operated on is essential. General anæsthesia, though abolishing the consciousness of pain, does not abolish the severe muscular spasm which may result from local heating effects of the diathermy current concentrated on a small area. With proper local anæsthesia, pain and the spasm phenomenon are both completely eliminated.

After a preliminary survey, the needle telescope is inserted or the preliminary survey may be made by the needle telescope itself.

This has been considerably modified since the first description of the instrument. It consists of a direct vision telescope with a very wide field of vision, and a lamp on a flexible shaft, giving brilliant illumination. The instrument is assembled with the lamp on its flexible shaft, projecting beyond the end of the telescope a distance equal to the length of the cannula. This is inserted through the cannula, then the telescope is pushed in afterwards. By this device, an instrument double the width of the cannula can be inserted into the chest through the cannula.

If a favourable position has been chosen, the telescope will point directly at the insertion of the adhesion. The needle should be pushed out as far as possible in order to get a good bird's-eye view of the part to be anæsthetised. A moment's consideration to get the proper orientation will tell the operator which way the nerves are running to the adhesion. The needle is inserted just under the parietal pleura at the spinal side or surface of the adhesion, and 2 per cent. novocain is injected. If the adhesion is between the instrument and the spine the adhesion can be pierced by the needle and the pleura beyond it injected. It is then advisable to inject several places along the width of the insertion, and even to put some local anæsthetic into the adhesion itself. It can easily be seen forming a bleb. If anæsthesia is complete, the patient will feel nothing, and there is no muscle twitching.

The Diathermy Machine.

The new technique of severing adhesions comprises two distinct operations: (1) the coagulation of a suitable portion of the structure, and (2) the actual cutting through the coagulated portion. For this a machine of special design is required. The ordinary diathermy apparatus used for treatment is useless because it will not cut. It has been demonstrated that a high-frequency current composed of sustained oscillations will cleave the tissues in the same way as a knife, but apparatus for production of continuous sustained oscillations is very complicated and costly. It requires a direct current of very high voltage and a thermionic valve. In practice a current composed of slightly damped groups of oscillations has the desired effect.

This current may be obtained by applying an alternating current to a circuit composed of a condenser, inductance and a thermionic valve. The last can, with advantage, be replaced by a specially designed spark gap. It is essential for clean cutting to use a very high oscillation frequency. Further, the damping losses must be reduced to an absolute minimum, otherwise only a very small current will flow in the circuit. The oscillation frequency is determined by the capacity of the condenser, and the inductance (size and number of turns of the coil) and must be of the order of 5 to 6 million cycles per second.

Such a machine has been designed by Mr. Schranz, of the Genito-Urinary Company, and it is to him that I am indebted for the technical description of the instrument.

It is fitted with a selector switch graduated from 0 to 10. Experience has shown that coagulation of an adhesion can be effected with the machine at zero. This will give deep coagulation. If the white zone of coagulation can be seen extending too far, or if coagulation is taking place too slowly, or if the adhesion is very short, and intensity rather than distance or depth of coagulation is wanted, the machine must be turned to 1 or 2. For cutting, the machine may be used from 2 onwards. Usually 2 or 3 is sufficient. This depends on the resistance of the adhesion, which unfortunately may vary in different parts of the same adhesion. It is better to be on the safe side and start too low; the machine can be turned on notch by notch until the required intensity is reached.

Over-coagulation produces great resistance. Sometimes if a cord adhesion has been over-coagulated, attempts at cutting it only succeed in completely carbonising it, and with the machine all out at 10 it may not yield. In such a state the adhesion can be broken by a blow from the electrode. If this is not possible I have devised a thin knife-edge that can be inserted through the needle telescope. This, in fact, could be used immediately after coagulation. Of course, such over-coagulation theoretically should not occur, but for beginners, at any rate, it is better to err on this side than to have arterial spurting if only from a minute arteriole.

It is essential to have good contact between the patient's body and the indifferent electrode. Careful observation should be made to see that the patient's body is lying firmly on the electrode. The electrode must be of ample cross-section, and its covering pad be kept thoroughly moist with salt solution.

CLINICAL AND LABORATORY NOTES

A CASE OF CARCINOMA OF THE BREAST

SUGGESTING THAT RADIUM CAN STIMULATE THE GROWTH OF CANCER CELLS.

By W. H. C. Romanis, M.Chir.Camb., F.R.C.S. Eng.,

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It has long been held by many surgeons that under certain circumstances X rays or radium might be capable of stimulating the growth of cancer cells instead of destroying or inhibiting them. It has even been thought that insufficient or improperly applied dosage might be responsible for this. At the same time it is a difficult matter to prove, and I have on one or two occasions heard enthusiastic radio-surgeons state that they did not believe it, and had never seen a case of the kind. The following case is undoubtedly very suggestive that an actual stimulation by radium of carcinoma cells has occurred.

Miss A. B., aged 55, was sent to me by Dr. Harry Smith, who had only seen her for a few days, with an advanced carcinoma of the breast. As the skin was slightly infiltrated, the growth adherent to the muscles underneath, and large hard glands present both in the axilla and the supraclavicular fossa, it was decided that the growth, was inoperable in the ordinary sense of the term, and it was determined to use radium needles of 1·0 mg. each by the usual technique of implantation for 14 days. Thirty needles were implanted at the usual sites — i.e., in a circle round the periphery of the growth, in the axilla, in the supraclavicular fossa, the intercostal spaces, &c. The main bulk of the growth diminished considerably in size though it never completely disappeared, while the supraclavicular and axillary glands at any rate remained stationary, and possibly also diminished slightly. Within six months, however, hard nodules, varying in size from a dried pea to a hat-pin's head, had appeared in the skin in every one of the needle punctures surrounding the growth. These were typical secondary nodules, hard, prominent, red, and adherent to and infiltrating the skin. These continued slowly to increase in size until the patient died shortly afterwards.

As the recurrent nodules occurred exactly in the line of and at the spot of introduction of the radium needles, it is difficult to resist the conclusion that at these particular spots, at any rate, there was some stimulation or encouragement of the growth of carcinoma cells.

THE PREVENTION OF THROMBOSIS.

By C. A. J. Quant, M.D.,

DIEPENHEIM, HOLLAND.

It is well known that thrombosis occurs more often in the left leg than in the right, both after operation and after delivery, in the form of phlegmasia alba dolens. Even after appendicectomy the thrombosis is usually seen on the left side. This curious fact does not receive the appreciation it deserves, despite the large amount of work that has been done on the causes of pelvic thrombosis. It suggests that the thrombosis is not in direct connexion with the veins of the wound of the operation, or with the inside of the uterus, and that some anatomical explanation is likely to throw light on the causation of thrombosis.

All authorities agree that slowing of the blood stream is one of the most important of the possible causes of coagulation, especially if there is a constriction in the vessel. The veins of the pelvis are asymmetrical and bear a different relation to the corresponding arteries. The inferior vena cava is formed on the right-hand side behind the origin of the iliac arteries, while behind Poupart's ligament the arteries lie lateral to the veins. The arterial system is more symmetrical than the venous system; the right iliac vein passes into the vena cava almost in a straight line, while the left enters at an angle. This must make it more difficult for the blood to pass into the vena cava from the left side than from the right. A similar asymmetry is seen in the arrangement of the carotid arteries, and to this has been attributed the preponderance of right-handedness, as the left side of the brain obtains a better blood-supply. Prof. L. Bolk, of Amsterdam, has proved that more blood passes through the left carotid than through the right. Another example of asymmetry is seen in the spermatic veins; the left vein enters the left renal vein almost at a right angle, and varicocele nearly always appears on the left side.

This obstruction to the return of blood from the left leg and left side of the pelvis makes itself fully felt owing to the absence at this place of fatty packing between the veins, the arteries, and the bones. The German surgeon Riedel noticed that the right iliac artery crosses the left iliac vein transversely and at the same point the middle sacral artery crosses behind the vein. These two arteries, therefore, hold the vein between them like a pair of forceps and must cause constriction just before the dilatation due to the union of the vein with the right iliac. Another more caudal constriction occurs on the left side where the hypogastric artery crosses the iliac vein. That pressure of this kind may have pathological results is shown by the weakness of the right arm and right pulse when the subclavian artery comes off the descending aorta and passes between the vertebral column and the œsophagus.

THE EFFECT OF LYING ON THE BACK.

Thrombosis chiefly occurs in patients who have been on their backs for a week or more at a time, when the action of the heart and the effects of muscular contraction on the vessels are reduced; there are, therefore, very likely to be dilatations on the cranial side of the strictures with whirlpool formation and sedimentation of thromboblasts. The whole pelvis will be an "area of least resistance," and the minimum pressure will be found on the left side. The possibility of compensating for the hæmostasis by collateral circulation is less on the left side, since the hemi-azygous system is smaller than the azygous system and has to cross at a right angle between the aorta and the dorsal vertebræ.

It seems possible that the "strangulation" of the left iliac vein by the right iliac and middle sacral arteries is increased when the legs are stretched out in dorsal decubitus, and this may be one reason why few people sleep in this position for long at a time. The extension of muscles, tendons, and ligaments also

helps to make the circulation of the blood more difficult.

We know nothing as yet of the cause of thrombosis, but there are certain conditions in which it occurs relatively often. These are anæmia, adiposity, enteroptosis, old age, and the results of Spanish influenza. In all these the action of the heart is weakened, and the patients who suffer from thrombosis seem all to have been quiet and to have tried to move as little as possible after their operation or delivery. There must, however, be some determining cause in the actual operation, for thrombosis does not occur even in the strictest rest cures—e.g., after hæmatemesis. Roegholt, a Dutch specialist in the East Indies, has pointed out that he never saw a case of thrombosis there, either in Europeans, natives, or Chinese, and he was struck by its relative frequency when he returned to Holland. He attributed the difference to the great heat and the mosquitoes, which, together, make the patients in the tropics much more restless. The greater restlessness of young people may perhaps account for the absence of thrombosis under the age of 20. Restlessness has another consequence, for it loosens the bandages. Tight bandaging, especially round the abdomen, may possibly increase the difficulty in the blood flow, and it helps to limit the action of the abdominal muscles.

SUMMARY.

Subject to the fulfilment of other conditions, slowing of the blood stream is probably the determining cause of thrombosis. Statistics show that this nearly always occurs on the left side of the pelvis, which is, perhaps, the weakest link in a chain. Anatomical considerations show that strictures and whirlpool formation are very likely to occur in the iliac vein in this region, and the possibility is greatly increased by long confinement to bed, lying with outstretched legs, tightly tucked-in blankets, and a tight bandage round the abdomen and hips.

The obvious lesson is that patients should be moved as soon as possible and allowed to get up for short periods several times a day.

"MASTOID DYSPEPSIA" IN A CHILD.

BY LINDSEY W. BATTEN, M.B. CAMB., M.R.C.P. LOND.,

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THAT dyspepsia in infancy, whether acute or chronic, is often the main symptomatic expression of an infection outside the intestinal tract is, of course, well known, and of late years special attention has been paid, especially in the United States, to otitis and mastoiditis as causes of diarrhœa and vomiting.

AMERICAN VIEWS.

L. E. Hetrick,[1] in a recent review of the subject, quotes Renaud as finding pus in the mastoid antra of 70 infants dying of gastro-intestinal disturbances in 1921, and states himself that of 30 cases of mastoiditis at the St. Louis Children's Hospital 56 per cent. had the symptom-complex of increasing temperature, diarrhœa, vomiting, loss of weight, and athrepsia. L. W. Dean,[2] writing on the same subject, states that dehydration, refusal of food, diarrhœa, and loss of weight may be the factors that will decide whether myringotomy should be performed. "They may indicate mastoidectomy," he says. "If otitis be present it can always be diagnosed." M. L. Floyd[3] describes the same clinical picture, adding that the bowel condition does not respond to diet rearrangement and that the mastoiditis is masked. He holds that "bilateral mastoidectomy performed as soon as the condition is determined and other foci eliminated has resulted in prompt recovery of many of these infants and is probably the only means of saving the child's life."

On the other hand, L. Richards,[4] of Chicago, analysing a considerable group of cases is inclined to question the causal relationship of the dyspepsia to the otitis or mastoiditis, is not impressed by the effect of surgical treatment of the ear condition on the course of the disease and finds that mastoidectomy has no advantage over myringotomy in this respect. "Operation, regardless of whether an infected mastoid antrum had been drained or not, did not appear to have improved the patient's general condition to any appreciable extent. The feeling was always borne in on us that the babies were too sick to benefit by having a subsidiary condition remedied."

Little seems to have been written on the question in this country.

A CASE NARRATED.

A boy, aged 11 months, was admitted to the Children's Hospital, Hampstead, on Feb. 19th, 1930, primarily because a small superficial sore on the glans penis following circumcision at the hospital was causing concern to his parents. The following history was elicited later.

Six days before admission he had been quite well. He was taken to a welfare centre on that day and weighed 21 lb. On the next day he had some pain in the left ear and a discharge from it on the night following. He had no diarrhœa or vomiting.

On admission he had a temperature of 100·4° which fell to 98° on the next day. I saw him first on March 2nd. He then weighed 19 lb. 8 oz. and had the appearance of a child with a toxic dyspepsia such as might arise from wrong feeding or gross underfeeding in a bad environment. (Actually his home conditions were good and his parents careful and not ill-informed.) He was pale and listless, taking little notice of his surroundings and not attempting to sit up. His skin was dry, his muscles very flabby. There was a muco-purulent discharge from the left ear, the tonsils were very slightly enlarged, and a few glands were palpable in the neck. Nothing abnormal was found in the chest or abdomen. No teeth had erupted but he was otherwise well-grown and there was no clinical evidence of rickets in the bones. Since March 29th his temperature had been normal; he was constipated and his appetite was poor.

A mixed diet, suitable to his age, was ordered and "open-air treatment" on the balcony, weather permitting. I saw him again on April 6th. On this day he had begun to vomit his food, he looked less well, but there were no new physical signs. He now developed a severe dyspepsia. His stools became frequent, loose and then watery, though yellow in colour. He refused food and vomited what he was induced to take. Citrated milk and water mixtures, Benger's food and whey, whey alone, glucose and water, and even water were vomited, prostration and listlessness became extreme, and he lost weight rapidly, reaching 18 lb. 7 oz. on April 9th.

The manner of onset of the dyspepsia and its complete lack of response to dietetic and other treatment suggested that it might be symptomatic and due to some parenteral infection. There was no evidence of any such infection except in the ear and, with the American literature in my mind, I asked Mr. C. Gill-Carey to see him. He found the right ear normal, the left apparently draining freely, and no signs of mastoiditis on either side, but we agreed that in view of the child's general condition the left mastoid ought to be explored. Normal saline subcutaneously and glucose solution by the rectum were given to combat dehydration, and on the evening of April 10th the left mastoid was explored by Mr. Gill-Carey under local anæsthesia. Small beads of pus were found scattered throughout the softened bone. Mastoidectomy was performed, the cavity was packed with gauze smeared in bismuth iodoform paste, and the wound left widely open. A swab taken from the pus grew hæmolytic streptococci.

The child was very little disturbed by the operation and there was no shock. Next day he took and retained his feeds well, the bowels acted less frequently, the stools improved, and he was much more alert. Improvement continued for four days but on the fifth he relapsed. Vomiting, prostration, and refusal of food returned, there was slight fever and a rapid pulse, and he again looked very ill. The right ear-drum, which had been normal, seemed to me to be no longer so, and I asked Mr. Gill-Carey to examine it again. He found signs suggesting fluid in the middle ear though there was no redness or actual bulging of the membrane and no mastoid tenderness, and it was decided to perform right mastoidectomy. This was done, again under novocain anæsthesia, and pus was found in the bone.

The child bore the second operation less well than the first. There was some febrile reaction, and though vomiting ceased the stools continued to be loose and frequent for another five days. After this, however, a very definite improvement began and was maintained, the weight rising from 17 lb. 10 oz. on April 28th to 20 lb. a month later. Two slight setbacks appeared to be due to partial blockage of drainage, on the first occasion from the nearly healed right mastoid sinus and on the second from the left ear, the chief symptom in each case being loss of appetite. The boy is now very well and on June 17th weighed 22 lb. 2 oz. Both mastoid sinuses are healed and the discharge from the left ear is very slight.

In view of the experiences of Richards quoted above it may be that we were fortunate in the outcome of the case, but the apparent effect, especially of the first operation, in reversing the course of a rapidly progressive toxic dyspepsia was immediate and pronounced; relapse appeared to synchronise with the onset of trouble in the second ear, and it is hard to believe that the dyspepsia was not secondary to the mastoiditis or that myringotomy or anything short of what was done could have had a like effect.

REFERENCES.

1. Amer. Jour. Surg., 1929, vi., 741.
2. Arch. Otolaryngol., 1927, vi., 201.
3. Ibid., 1925, i., 411.
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A CASE OF CONGENITAL SYPHILIS WITH SYPHILITIC MENINGITIS.

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IN THE LANCET of June 21st Dr. Kramer described a case of syphilitic meningitis in an adult with acquired syphilis. The following case forms a contrast. A boy of 15 was admitted to the Mental Hospital at Rowditch suffering from restlessness and a high degree of mental confusion. From the previous history was elicited that up to the age of 7 he was subject to an occasional convulsive attack, and at that age also contracted scarlet fever. From the age of 7 to 14 he appeared normal and attended school regularly. In the beginning of November, 1929, he began to suffer from headache, listlessness, impairment of memory, and abnormal sleepiness. Gradually the mental condition deteriorated; motor restlessness and insomnia supervened.

On admission, Nov. 23rd, 1929, he was very confused, irritable, and restless, and continually making whining noises. He gave no indication of understanding what was said to him, and could only utter a few simple words. He was easily angered, and then fell into a state of uncontrolled frenzy.

Physical Examination.—Poor physique, fairly nourished; ears large and flattened, palate high-arched and narrow, frontal bossing. The central incisors were peg-shaped and notched. Temperature normal, pulse 90 per minute. Pupils dilated and reacted very sluggishly to light, cranial nerves normal. Knee-jerks brisk, plantar reflexes gave a flexor response. Albuminuria present.

Serological examination gave the following results: Kahn reaction of blood and C.S.F. strongly positive (++++). The cerebro-spinal fluid escaped under slightly increased pressure, was clear, and gave no coagulum on standing. Seventy cells per c.mm., chiefly lymphocytes, but some plasma cells were present. The colloidal gold curve was of the paretic type (5533322100), and globulin was considerably in excess.

A diagnosis of juvenile general paralysis was made. Owing to his exhausted condition and the albuminuria, however, neither malarial nor salvarsan treatment was undertaken. On Dec. 4th he began to develop syphilitic ulceration around the anus, which was successfully treated by mercurial inunction. A fortnight later his physical condition became distinctly worse with marked wasting and difficulty in taking food. The temperature was slightly raised on three or four occasions, otherwise remained normal throughout. A week before death meningeal symptoms became very prominent with pronounced head retraction, positive Kernig's sign, widely dilated and inactive pupils, Babinski's sign, and gradually increasing blindness. His whining noise had now become a typical meningitic scream. On Dec. 30th he merged into coma, and died two days later.

At *autopsy* the brain showed an extensive meningeal exudate of a milky colour, especially well marked over the convexity and in the Sylvian fissure. It was quite unlike the milkiness of the membranes seen in the paretic brain and much more profuse. No tubercles or gummata were visible. The exudate over the lateral aspect in places approached 2 mm. in thickness. The lower parts of the frontal and parietal lobes showed considerable flattening and shrinkage of the convolutions. There was but little meningeal exudate at the base of the brain. Some degree of internal hydrocephalus was present with excess of cerebro-spinal fluid. Granulations could be seen on the floor of the fourth ventricle. Microscopical examination showed the exudate to consist of lymphocytes (chiefly) and plasma cells. The pyramidal cells showed varying stages of chromatolysis and capillary proliferation with perivascular cuffing, indistinguishable from that seen in general paralysis.

The feature of this case is the development of syphilitic meningitis manifested by the pronounced meningitic symptoms, and further confirmed by the extensive inflammatory exudate on the surface of the brain, whilst at the same time there were physical signs, serological evidence—e.g., paretic gold curve—and certain anatomical signs of juvenile general paralysis.

My thanks are due to Dr. John Bain, medical superintendent, for permission to publish these notes.

SCARCITY OF NURSES IN SCOTLAND.—Speaking at the annual meeting of the Edinburgh Club for Nurses recently, Dr. Parlane Kinloch, chief medical officer of the department of health for Scotland, expressed the fear that at an early date there will be an acute scarcity of trained nurses. An enormous number of women, he said, after they were trained as nurses, went abroad owing to the fact that in the colonies and the United States the prospects were better. Rectification must be looked for in better organisation of training, better status, and better emoluments. He suggested that all the representatives of the nursing profession should come together and endeavour to devise a policy under which nurses should be comprehensively trained. A medical student had five years of intensive training, and was led through the whole gamut of medical experience, but if a nurse wished to get to the head of her profession she must take three years' training in a general hospital, three years in a fever hospital, six months for maternity training, a year to a year and a half for mental disorders, and so on. This was an impossible state of affairs. He thought it might be possible to recruit girls at 16 or 17, and have four principal nursing colleges—at Edinburgh, Glasgow, Aberdeen, and Dundee—to which they might be sent for preliminary training.

MEDICAL SOCIETIES

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

A MEETING of this Society was held at Manchester on June 27th–28th with Prof. J. S. DUNN in the chair. The membership is now 533.

J. CRUICKSHANK (Aberdeen) had been searching for *B. lactis aerogenes* in normal fæces, and had found it in 98 of 135 cases; like many bacteria it was more common if it was specially looked for. He also detailed some curious observations on the capacity of different microbes to ascend a strip of blotting-paper along with ascending water. *Coli*-like bacteria climb best, irrespective of their motility. Tetanus does not go up, nor do pasteurellas; hæmolytic streptococci hardly rise at all, while the pneumococcus climbs well. The differences may perhaps be due to differences in electrical charge. The method may be used practically for separating mixtures of bacteria.—A. T. GLENNY and MONA LLEWELLYN-JONES (London) had carefully compared the various in vivo and in vitro methods of titrating diphtheria antitoxin, and found that the ratio between the animal test and the flocculation test was always the same with sera of any practical value; anomalous results were sometimes obtained with old or weak sera.—E. M. DUNLOP (Glasgow) found that there was a constant difference between normal and syphilitic sera in a simple lipoid flocculating system.—G. L. TAYLOR (Cambridge) pointed out that by using Dean's method of optimal proportions a mixture of two precipitins could be correctly titrated, and the amount of residual antibody in an antigen-antibody test could be determined.—J. GORDON (Leeds) described the effect of Congo red in preventing hæmolysis by a serum hæmolysin owing to its combination with complement. The dye does not react with the blood corpuscles.—J. M. ALSTON, G. R. GALBRAITH, and D. STEWART (Edinburgh) found that the soluble specific substance of type I. pneumococci strongly inhibited the bactericidal action of whole blood on the pneumococci, and also gave very definite reactions in intradermal inoculation into patients convalescent from pneumonia due to type I. but not in those who had been infected with the other types.—R. W. FAIRBROTHER and W. T. J. MORGAN (London), after prolonged immunisation of a horse, had obtained a serum which had a clear action in protecting monkeys against the virus of poliomyelitis, the horse being dosed with emulsions of the central nervous system of infected animals. A second horse gave entirely negative results.—C. H. BROWNING, D. F. CAPPELL, R. GULBRANSEN (Glasgow) had failed to get evidence that splenectomy made mice more susceptible to *Trypanosoma congolense*.—C. H. BROWNING and R. GULBRANSEN (Glasgow) described how the infection of mice with *Spirillum muris*, after a preliminary septicæmia, settles down to a stage in which the organisms can be demonstrated by inoculation but not microscopically. So long as this lasts, a fresh dose does not lead to any septicæmia, but if the animals are really cured by, e.g., salvarsan, septicæmia follows.—J. F. GASKELL (Cambridge) showed that subcutaneous doses of 1·0 g. of alcohol per kg. body-weight given daily for about three weeks much depressed the resistance of rabbits to the pneumococcus, though the animals gained weight and seemed in excellent health. Incidentally he had noticed that pregnancy definitely increased resistance. He also described some cases of fatal puerperal septicæmia in which infection seemed to be kept up by an infected clot in the iliac veins after the uterus has involuted in a normal manner.—C. E. JENKINS (Salford) showed and described his flicker hæmoglobinometer, which he claimed was more accurate than the usual methods.—G. R. CAMERON (London), working with artificial precipitates, bone, and calcified arteries, showed that neither the von Kossa test with silver nitrate nor hæmatoxylin were really tests for calcium. The former is given by a variety of phosphates, carbonates, and oleates; the latter stains something which often accompanies calcium deposition, but not calcium salts. Alizarin is the only specific stain, and this is not always easy to bring off.—C. POLSON (Leeds) had produced extensive liver necrosis by intraperitoneal administration of a carcinogenic shale oil; it might lead to a hobnailed liver. Similar oils which were not carcinogenic did not have this effect.—I. BERENBLUM (Leeds) showed that blast furnace tar might be carcinogenic, though it was generally said to be harmless.—L. F. FOULDS (London) described a slow-growing transplantable mouse sarcoma composed of mast cells.—R. WHITEHEAD and G. JEFFERSON (Manchester) described a papilliferous cystoma of the petrous bone, the origin of which could not be determined.—R. CRUICKSHANK (Glasgow) presented a study of the occurrence and properties of Döderlein's vaginal bacillus, which was easy to grow and anaerobic, and associated with the presence of an acid secretion.—K. V. BAILEY (Manchester) summarised his studies of the origin of carcinoma of the cervix, and emphasised the importance of the action of an inflammatory exudate on the basal layers of the epidermis. J. BRAXTON HICKS (London) showed a case of porencephaly, and said that there was no acceptable explanation of the anomaly.

DEMONSTRATIONS.

Among the demonstrations were: J. S. DUNN (Manchester), an enormous œsophageal varix; diffuse metastatic melanosis of the meninges; acute hæmorrhagic pancreatitis with impacted gall-stone. H. GARNETT WRIGHT and J. S. DUNN (Manchester), fibrous carcinoma of pylorus. W. SUSMAN (Manchester), paragangliomata of the suprarenal, human and bovine. J. H. BIGGART and A. M. DRENNAN (Belfast), persistent eosinophilia with localised infiltrations. JANET S. F. NIVEN (Cambridge), the repair of embryonic bones in vitro after fracture. M. J. STEWART (Leeds), asbestosis bodies in the lungs of guinea-pigs living in an asbestos factory. E. R. FLINT, H. WOLFE, and M. J. STEWART (Leeds), permeation of the Haversian canals of the skull by an arachnoidal endothelioma with hyperostosis. F. F. HELLIER and M. J. STEWART (Leeds), atrophied adrenals in Addison's disease. C. POLSON (Leeds), congenital malformations of œsophagus and trachea and of the ileum. J. MILLS (Reading), plasma-celled myeloma. W. H. TYTLER and J. B. DUGUID (Cardiff), a reticulum cell endothelioma of mediastinal glands (? carcinoma of lung). G. HASWELL WILSON (Birmingham), organs from a case of psittacosis. A. L. TAYLOR (Bristol), diffuse sarcomatosis of stomach and intestines with secondary cutaneous deposits.

EDINBURGH OBSTETRICAL SOCIETY.

AT a meeting on June 11th, with Dr. H. S. DAVIDSON, the President, in the chair, a paper on

Habitual Abortion

was read by Miss E. V. CROWE. This condition, she said, was by no means always associated with spirochætal infection, and during the past two years 19 non-syphilitic cases had been treated at the

antenatal department of the Royal Maternity Hospital, Edinburgh. In nine of the cases the abortions were preceded by a full-time, often instrumental, labour. Two of the 19 patients were suffering from toxæmia, five from cervicitis, one from pyelitis, and two from valvular disease of the heart. All showed general debility made manifest by anæmia, emaciation, sallowness, listlessness, headaches, constipation, and loss of appetite and strength. All had enjoyed fairly good health until their first pregnancy, after which this chronic ill-health developed. The majority lived in the poorer districts of Edinburgh, where both fresh air and sunlight might have been lacking. The average number of pregnancies was five in the short space of five and a half years—and this might be of some significance. Dental caries or pyorrhœa was present in 11, and septic tonsils in five. All were treated in much the same way, with repeated doses of neokharsivan and a special diet which was rich in calcium. They also had special treatment for the cervix, teeth, &c., where necessary. The results were, in the main, satisfactory.

Abdominal Hysterotomy.

Dr. THEODORE HAULTAIN reported 28 cases in which abdominal hysterotomy was done by the staff of the Royal Maternity Hospital during the last three and a half years. The commonest indication (12 cases) was severe toxic hyperemesis. The others included albuminuria with persistent high blood pressure in the earlier months of pregnancy (5); toxic pyelitis leading to persistent hyperemesis (3); and myocarditis (3). The operation was also done twice in association with myomectomy for degenerating fibroids invading the decidual lining of the uterus, and once each for acute toxic chorea gravidarum, hydatidiform mole and acute phthisis. Only one patient died, a mortality-rate of 3·6 per cent., and this was thought remarkable since more than half the patients were almost in extremis before operation. This rate compared favourably with the 20 per cent. mortality of 25 cases of vaginal hysterotomy for similar indications in the three previous years. The comparative safety of the abdominal route was due to the rapidity and ease of the operation, and to the absence of the severe shock and bleeding sometimes associated with vaginal hysterotomy. In cases with dehydration—a frequent cause of death in toxic cases—the peritoneal cavity could be filled with saline. Furthermore, for suitable patients, sterilisation could be done at the same time, and in cases of hydatidiform mole the growth could be removed completely and with certainty. Induced abortion between the third and sixth month was painful and tedious, especially in primiparæ. So far it had not been found that the operation had any bad effect on future conception. One of the patients had had two children since the operation for hyperemesis in 1927.

Dr. C. D. KENNEDY gave an account of four successful cases of abdominal hysterotomy, two of them for severe pregnancy toxæmia, one for an acute exacerbation of a chronic nephritis, and one for acute chorea gravidarum. The first three were operated on under spinal the fourth under general anæsthesia.

OPHTHALMIC DISEASES IN COUNTY DOWN.—A report to the Down County Council states that there are 529 blind people in the county, 20 of whom are under 16 years of age, and 6 between 16 and 20. The children suffering from external diseases of the eye number 863, 3833 suffer from defective vision, and 620 from squint. Other ailments bring the number of children in County Down in need of remedial treatment up to more than 20,000—55 per cent. of the total.

TUBERCULOSIS CONFERENCE.

LONDON, JULY 3RD–5TH.

THE sixteenth annual conference of the National Association for the Prevention of Tuberculosis was opened by the Minister of Health, who referred to the significant fall in the death-rate from tuberculosis. The unification of public assistance with the health services, he said, would enable the local authorities to visualise the problem as a social rather than an individual one. Without adequate after-care of the patient much of the expenditure incurred in treatment and prevention might be wasted.

Sir GEORGE NEWMAN spoke on the origin and social purpose of the

Local Government Act, 1929.

He traced the development of the Act out of the Reform Bill of 1832, and outlined its relation to tuberculosis. Now, for the first time in history, a public medical tuberculosis service was placed in the hands of one authority, concerned in public health, public assistance, and education. The disease, he said, was essentially connected with such social problems as poverty and housing, and social and sanitary improvements during the last sixty years had produced a remarkable decline in the disease as a whole. The Act made it possible to apply in very many areas the principles of the scheme designed by Dr. Lissant Cox for Lancashire.

Dr. J. PARLANE KINLOCH dealt with those aspects of the Act especially applicable in Scotland. The rate of decline in mortality had been greater, but the total death-rate was still greater in that country than in England and Wales. The new Act had given an impetus to the development of regional schemes of health administration, and institutional authorities and doctors were being organised in a way which would bring the medical profession into a new relationship with the hospitals. The tuberculosis clinic would be brought into organic union with other health service clinics and research would be stimulated.

Dr. NORMAN PATRICK said that attempts were still on foot in Northern Ireland to consolidate the Local Government Acts, following England and Scotland as closely as possible. The greatest difficulty was the coördination of the tuberculosis and maternity and child welfare services.

Councillor G. A. GRIFFITHS said that in practice chief medical officers had to do what their local authorities told them, and thought that an inspection of the workers' pantries would reveal the origin of tuberculosis. In the West Riding of Yorkshire only three kinds of shops kept going to-day: the margarine shop, the American meat shop, and the pawnshop.

Councillor P. MCKENNA urged a subsidy to provide adequate housing for discharged patients.

Dr. W. BOLTON TOMSON warmly supported this suggestion, and paid tribute to the work done at Sheffield in allocating houses to the hospital committee for the use of tuberculous patients.

Councillor G. BRETT said that in Leeds 6 per cent. of all new houses were earmarked for tuberculous families and another 6 per cent. for the prevention of overcrowding, but without a subsidy this only touched the fringe of the problem; the trouble was to find houses at a rent which these families could afford.

Dr. E. E. PREST spoke of the importance of minor tuberculosis, and advocated the treatment of people who were "feeling ill" rather than of people with

shadows in their chests. Early treatment was the only means of ensuring perfect cure; people willing to go to a sanatorium might be exempted from notification.

EFFECT OF THE ACT ON INSTITUTIONAL TREATMENT.

Dr. J. A. WILSON described the Act as a measure of promise rather than of fulfilment. It should remedy the inadequacy of beds which had compelled local authorities to board out patients. To use the new accommodation to the best advantage a new survey of the disease was desirable. There had been important changes in its natural history during recent years: alteration in the age-distribution and the type. The case-mortality at ages over 25 had been markedly reduced in pulmonary tuberculosis, especially in females, and the non-pulmonary forms had shown a very marked reduction in the case-mortality under one year, with a much slower reduction in the 1–5 years age-period. These forms, other than meningitis, seemed to be decreasing in virulence. The highest incidence of the disease occurred in the smaller types of house, and institutional accommodation must therefore be estimated on the assumption that there could be little home treatment. A five-year inquiry in Glasgow dealing with 2500 patients had shown that one bed was required for every five registered cases, in the ratio of 4 male to 3 female beds. The disease had proved to be to a large extent a hospital one, so that the proportion of hospital to sanatorium beds should be 7 to 1, although in both types of institution the turnover was about two patients per bed per annum. For non-pulmonary cases the ratio of hospital beds to registered patients had been 1 : 3·3, equally distributed between the two sexes, but with only one patient per bed per annum. The use of X rays in diagnosis had largely removed the necessity for observation wards, but some provision had still to be made for a group of chronic respiratory conditions in children, usually associated with enlargement of the root glands and seen after epidemics of measles.

Dr. K. J. ACTON-DAVIS said that the problem of non-pulmonary tuberculosis was an entirely different one in children and in adults; in the adult there was nearly always a pulmonary lesion as well, and the prognosis, therefore, was far more serious. It was now generally agreed that the best method of treatment was in special State or State-aided institutions, with after-care in clinics at these hospitals, with the help of the schools. In London the treatment of surgical tuberculosis in children was as nearly perfect as it could be, but in smaller boroughs patients sometimes had to wait for vacancies in charitable institutions. It was among the adult cases that improvement might be expected from the new arrangements. The voluntary hospital was not the place for the treatment of tuberculosis; conservative treatment could not get a fair trial.

Dr. R. S. WALKER said that Paddington had incorporated the poor-law hospital into the tuberculosis scheme some years ago, and the guardians had invited the tuberculosis officer to join their visiting staff. Endeavours were made to induce patients to enter hospital from overcrowded homes for long periods of rest. They were willing to go into a hospital that was near home.

THE GRANT IN AID.

Dr. F. E. FREMANTLE, M.P., who opened a discussion on the effect of the change from percentage to block grant, said that the great drawback of the percentage grant had been that the more an authority spent the more it benefited, and he quoted figures showing the inequitable distribution that had prevailed. The block grant gave local authorities a security which enabled them to establish schemes over a period of years, and was based on the definite principle of need, including the five factors of population, rateable value, unemployment, mileage, and—most important from the tuberculosis point of view—the proportion of children to the population. Under the new system institutions could be pooled and counties would gradually be able to build up magnificent schemes of institutional provision, nursing and health-visiting, and laboratory and consultant services.

Dr. F. J. HENDERSON COUTTS reviewed the discussions which had waged round the problem of the block grant, and said that medical inspection must continue much as before if efficient administration and suitable development were to be secured, but time would be saved in discussing trivial details of expenditure. The percentage grant had undoubtedly acted in the past as a stimulus to development, and there was a certain danger in the inelasticity of an all-round grant.

Mr. H. L. FRASER described the development of tuberculosis schemes in Scotland, and thought that the new system would certainly assist the poorer counties. It was important that non-pulmonary tuberculosis should be treated in a few large centres rather than in many small centres.

Major WALTER ELLIOT said that the Act had been designed to make the local and central authorities partners in health work, and the local authority mainly responsible for expenditure. At the quinquennial revision the expenditure of the local authority as a whole would attract to it a greater revenue; therefore services could be floated up by quinquennial increases from the Treasury. This concession by the Treasury was of the utmost importance. Any system could be made to work by goodwill and public opinion, and in his opinion this Act gave the greatest possible scope to goodwill and enlightened public opinion. We had learnt in the twentieth century the necessity of dealing with a citizen as a citizen and not as a passenger, a parent, a prisoner, or any other one aspect of his civic life. Only along that avenue was it possible to bring home the other great lesson—that failure in public health was failure in economy. To keep a sick man, still more to keep a focus of infection, was much more expensive than keeping a Rolls-Royce. Progressive poor law authorities had grasped this fact before the Act, and had developed large and expensive health services. This showed the relative unimportance of the system of grants. Unified authorities would be able to drive home the economic loss in every department of life.

Alderman DAVID ADAMS thought that the block grant had material defects, as it need not necessarily be expended on public health services. In distressed areas there would be a great temptation to put it to the relief of the rates. Expenses were bound to fall on the local authority, and the quinquennial reconsideration was cold comfort.

Position of the General Practitioner.

Opening a discussion on the relationship of the general practitioner to the treatment of tuberculosis, Dr. G. LISSANT COX said that if the tuberculosis officer were the Cinderella of the public health services, it was doubtful whether the general practitioner was the good fairy or the ugly sister. He did not do nearly as much as he might do in the treatment and prevention of tuberculosis, and his failure was to be ascribed to the conditions under

which he worked, and his training as a student. Coöperation between him and the tuberculosis officer must be effective. He must have time to examine his patients carefully, and he ought to have a special training in tuberculosis, like that provided by the Scottish medical schools. Patients suffering from tuberculosis were rarely seen in general hospitals to-day, and the education of the practitioner therefore called for a close connexion between the tuberculosis dispensaries and the teaching hospital. Moreover, examiners almost always produced cases with old chronic fibroid phthisis, instead of early cases. The tuberculosis officer must be an expert, but no matter how good he was the results of his labour would be meagre if the general practitioner could not play his part in the tuberculosis campaign.

Dr. J. COHEN pointed out that late notification was as often the fault of the patient as of the practitioner, and should be attacked along the lines of educational work by the dispensaries. In large towns home treatment was very seldom possible or advisable, and the sanatorium provided education as well as treatment. Many tragedies followed the return to an overcrowded home, and it was difficult to see how to prevent them with the present housing conditions. A lack of interest in the dispensary among doctors might be due to lack of effort on the part of the dispensary to coöperate with the practitioner. The patient was treated at the dispensary and visited by the nurse, and did not keep in touch with his own doctor. It would be better for him to be seen more often by his general practitioner, who would send periodical reports to the tuberculosis officer. Dispensaries often prescribed medicine when the case should more properly be referred to the practitioner. Local practitioners might be invited to take an active part in the work of the dispensaries, the tuberculosis officer acting as consultant and supervisor. Public education should be one of the main functions of the dispensary. Practitioners would greatly appreciate a clinical report with patients returning to them from sanatoriums.

Dr. WILLIAM BRAND remarked that the insured patient was entitled to treatment for tuberculosis as much as for other diseases, and deplored the fact that patients who ought to be in bed insisted on dragging themselves out to the doctor's consulting-room or the dispensary. With the ascendancy of hygienic habits the cult of the medicine bottle and gallipot would disappear, and domiciliary treatment would become a much simpler problem. At present the two difficulties that constantly confronted practitioners and tuberculosis officers were in the prevention of reactivation when quiescence had been achieved in a sanatorium, and, secondly, in a speedy diagnosis of reactivation. Team-work was the first necessity in an attempt to make domiciliary treatment of much greater advantage than it was at present. The general practitioner could not stand alone, for any of his cases might require the other forms of treatment provided by the local authority —e.g., extra diet, hospital treatment, light treatment, or financial help in obtaining proper food or a separate bed. Moreover, the specially trained tuberculosis officer, equipped with modern refinements of diagnosis, could give great help in the difficult problem of early diagnosis.

Dr. V. J. GLOVER said that in Liverpool as much treatment as possible was given by the general practitioner, and uninsured patients were treated at municipal expense, the doctor being paid three shillings for each attendance. The cost of treatment was £6000 a year, and of medicines £2000 a year per 1000 patients under treatment. The scheme had worked successfully since 1913, and there was no fear that the practitioner would lose a case through notifying it.

Dr. VERE PEARSON spoke of the need for simplifying and improving the teaching of students, and said that tuberculosis dispensaries should be staffed by general practitioners. The great drawback to domiciliary treatment was the economic condition of the home. In Bergen, Norway, general practitioners were given a six weeks' holiday at the public expense to study in sanatoriums.

Alderman TAYLOR strongly opposed treatment by the general practitioner, who, he said, did not know enough about it, while the panel doctor was also far too busy.

Tuberculosis and Education.

Dr. W. L. BURGESS stressed the importance of coöperation and the need for each local representative of the service to have a new and wider outlook. The infection was usually contracted in childhood, but the child had a strong tendency to recover, and environment was an important factor in determining the course of the infection; the education authority, therefore, had a most important part to play. Every school medical officer must have at his service a skilled diagnostician able to recognise the child who required special attention from the tuberculosis department. Intimate contact between the two officials was essential; they should confer daily, and the tuberculosis officer must have free access to the school clinic and the school. Both officers must coöperate also with the nurse who visited the home; the tuberculosis nurse knew a great deal about the homes of the notified cases, but little about other homes or school life; the school nurse knew all about the school but little about the home. There should be more systematic examination of contacts. Continuity of treatment through all ages and in every environment was essential. The nursery school provided an intermediate phase between home and school where the two medical officers could look for fertile soil at a stage when prevention was a certainty. There was now no doubt of the value of open-air schools, but should not every school be an open-air school? It would be wise to assume that every child was a potentially tuberculous child, for modern civilisation made every child a contact. Benefit would be derived from handing over to the school medical officer the responsibility for the care of the pre-school child, and the nursery school must become a recognised unit in the educational system. Education authorities could play an important part in the campaign by supplementing and correcting diet.

Dr. GEORGE MACDONALD said that the open-air school was not merely school in the open air, but a way of life and a system of education and medical treatment. Its dining table should be a factor of educational value, and rest periods before and after the midday meal were very important. In London the tuberculosis officer was part-time school medical officer to the school for tuberculous children, and one of the dispensary nurses was part-time school nurse. The work of the school should include vocational training and after-care.

Mrs. LEAH MANNING described the open-air school at Cambridge and its routine. The morning was given to work and the afternoon to rest and recreative lessons.

THE NURSERY SCHOOL.

Miss MARGARET MACMILLAN described the open-air nursery school which children entered at the age of

two. By a growth and extension of this system she was sure that the hospitals could in time be emptied.

Dr. BRIDIE O'CONNOR said that a striking feature of the MacMillan open-air nursery school, where she was medical officer, was the freedom from catarrhal conditions. Healthy gastro-intestinal and respiratory mucous membranes were a very great safeguard against invasion by the tubercle bacillus. It has been shown that these children, most of whom came from one-roomed homes, acquired increased resistance to disease, and very marked recuperative powers. The pale, flabby, debilitated, rachitic, dull, and apathetic child became sturdy, happy, contented, bright, and responsive. There was a striking absence of complications after measles.

ASSOCIATION OF AMERICAN PHYSICIANS.

ANNUAL MEETING AT ATLANTIC CITY.

THE Association held its forty-fifth annual meeting at Atlantic City on May 6th and 7th under the presidency of Dr. THOMAS MCCRAE, of Philadelphia.

Symposium on Coronary Disease.

Dr. O. KLOTZ and Dr. W. D. M. LLOYD (Toronto) reported 44 cases of partial or complete coronary occlusion verified at autopsy. In 26 there was sclerosis with narrowing but not occlusion, and there were 18 cases of thrombosis, all accompanied by sclerosis. The commonest location of the sclerosis was in the descending portion of the left branch; next in the left coronary; and last in the right coronary. Sclerosis obstructing the orifice was more common in the right than in the left coronary. The thrombotic process appeared to be secondary and took place by dilatation with development of a thrombus. Under normal conditions anastomosis was free between the right and left coronaries. When the left coronary was involved and there was already a degenerative process on the right much more severe damage to the myocardium resulted. When only the left coronary was damaged the myocardium remained competent, anastomosis being enough to maintain circulation.

SYPHILIS.

Dr. A. S. WARTHIN (Ann Arbor) said that in 1675 autopsies in his laboratory in Michigan during 25 years there were 408 males and 86 females showing active syphilitic lesions in the aorta or central nervous system. Between 1910 and 1919 the average was 43 per cent. In the years 1919–29 332 cases of syphilis came to autopsy and of these 172 had coronary sclerosis. There were 55 cases of coronary syphilis and 5 cases of coronary thrombosis. In both decades it was found that the incidence of coronary sclerosis was a little higher in autopsies on syphilitics as compared with non-syphilitics. The figures showed that death occurred ten years earlier, and sudden death was commoner, among the syphilitics.

PROGNOSIS IN CORONARY THROMBOSIS.

Dr. LEWIS A. CONNER (New York) reported on 287 cases of coronary thrombosis, 243 men and 44 women, of whom 117 were private patients. Antecedent disease in 274 cases was as follows: arterial hypertension, 93; syphilis, 39; diabetes, 28 (total 58·3 per cent.). The age of the patients at first attack was as follows: Before 35, 3 per cent.; 41–45 years, 11 per cent.; and 50–60 years, 22 per cent. From 61–65 there was a very sharp drop—that is, 75 per cent of all cases occurred before the age of 61. As regards sex, it was found that the women lagged behind the men in the early cases, but a large proportion of first attacks in women occurred between 55 and 60 years. Of the 287 cases, 117 (45 per cent.) were still alive, and 28 had been lost sight of. Forty-six had died in the first attack; 89 were well after the first attack, and 28 of these were well up to the second attack, when they died. The total duration of life varied from 3 months to 17 years after the first attack, and was grouped as follows:—

	Cases.		Cases.		Cases.
3 months ..	109	4 years ..	40	9 years ..	4
6 ,, ..	101	5 ,, ..	25	10 ,, ..	4
1 year ..	88	6 ,, ..	17	11 ,, ..	3
2 years ..	65	7 ,, ..	15	12 ,, ..	2
3 ,, ..	49	8 ,, ..	7	17 ,, ..	1

The relation of prognosis to severity of symptoms was as follows: 68 per cent. died with very severe attacks; 10 per cent. died with mild attacks; 31 per cent. recovered from very severe attacks; 43 per cent. recovered from moderate attacks; 26 per cent. recovered from mild attacks. Thus it seemed that very severe attacks are very often recovered from. In regard to previous symptoms, 38 per cent. had had symptoms and 62 per cent. had had no symptoms before the first attack. The interval between the first and second attacks in half the cases was less than one year, and in the others it was from 3 months to 18 years. In some cases there were more than two attacks. One patient had 7 attacks before he died. Embolism occurred in 42 cases. An electrocardiogram was made in 151 cases; 21 patients had normal tracings, of whom 14 are living and 7 have died. There was T wave change in 37. With auricular fibrillation or bundle branch block the prognosis was very bad.

These studies, said Dr. Conner, suggested that coronary thrombosis was a disease of early middle life. If the underlying condition was arterio-sclerosis, perhaps some of the changes were occurring in other organs. Diabetes might be caused by thrombosis of the pancreatic artery, and renal embolism might be due to thrombosis.

CHANGES IN ELECTROCARDIOGRAM.

Dr. R. W. SCOTT (Cleveland) reported (with H. S. FEIL, L. N. KATZ, and R. A. MOORE) experiments on the electrocardiogram in dogs. Under barbital anæsthesia the ramus descendens of the left coronary artery was tied at various levels; the inferior vena cava was also ligated for five minutes. Ligature of the vena cava gave negative results, because the collateral circulation was extremely abundant. If the coronaries were tied the chart showed the influence of extrasystoles and tachycardia. Ligature of the descending branch of the left coronary for 30 minutes caused no marked R–T deviation, but further impairment of the vena cava produced R–T deviation as seen in coronary thrombosis. Development of an abnormal mechanism, such as tachycardia or extrasystoles, produced deformities of the R–T tracing typical of coronary occlusion.

Dr. E. P. CARTER (Baltimore) said that in the past few years there had been an attempt to use the electrocardiogram in coronary disease to localise the site of the insult as well as the extent of the myocardial damage. Not enough emphasis had been laid on the duration of the trauma or on a properly correlated clinical diagnosis. Smith's early experimental work had laid great stress upon the ligation of the coronary vessels, but it was now known that heat and cold could easily upset any phase of the ventricular

complex. Lesions resulting from interference with the coronary circulation were due to ischæmia or local anoxæmia, and the significance of the changes in the electrocardiogram depended on the rate at which the lesion developed. The perturbations of the end-phase of ventricular work represented the degree of anoxæmia present in the myocardium. Dr. Carter wanted to emphasise the significance of lesions leading to diffuse myocardial disease, as distinct from those of the septum and main stem. There were lesions due to toxic changes, and also to systemic change as in myxœdema, and in such cases changes in the end-phase must be interpreted in the light of the other clinical findings.

Discussion of Symposium.

Dr. JAMES B. HERRICK (Chicago) thought the question of coronary obstruction was very far from settled. It was not always possible to interpret the electrocardiogram. There was a great deal of difference clinically between acute transitory partial obstruction and gradual permanent complete obstruction. The electrocardiograms of both forms deserved more extended study before their significance could be stated positively.

TWO EFFECTS OF OCCLUSION.

Dr. EMANUEL LIBMAN (New York) spoke of two further effects of coronary artery occlusion. The first was its influence on the papillary muscles, especially the posterior muscle on the left side. This was supplied by the descending branches of both coronary arteries and these were frequently diseased. Fibrosis and atrophy not infrequently took place in the muscle and might lead to chronic dilatation of the heart. As far as he knew this condition had not hitherto been described. The other effect of coronary artery disease he had in mind was aneurysm of the left ventricle. In 1919 he had outlined a method of recognising aneurysm involving the anterior wall of the left ventricle, and employing that method he had suspected its presence 44 times in his private practice during the past three years—i.e., in 27 per cent. of all cases in which he suspected the presence of marked coronary occlusion. Klemperer, reviewing the figures of the past three years in post-mortem examinations at Mount Sinai Hospital, found that 50 per cent. of all cases of marked occlusion revealed an aneurysm somewhere in the heart and that the figures for aneurysm of the anterior wall of the left ventricle was 38 per cent. Another indication of this condition was a gallop rhythm of anapæstic type, heard best at the left border of the sternum low down. He found that Réné Marie had made the same observation, but he had not mentioned the important fact that the gallop rhythm should be looked for while the patient was lying down. It might be absent on standing.

Dr. Libman was not convinced that coronary thrombosis was simply a part of the arterial disease, and he believed it was essentially part of a general condition. The patients had often suffered earlier from thrombosis of the arteries of lower limbs or the brain.

Dr. CONNER said that, being familiar with Dr. Libman's views concerning the frequent association of other arterial thromboses with coronary thrombosis, he was somewhat surprised to find that in only two of the cases was there a record of other arterial involvement. There were four cases in which thrombosis of one or more large veins occurred after the cardiac attack; but in these it would be difficult to feel sure that they were not dependent merely upon the circulatory impairment.

PROGNOSIS AND TREATMENT.

Dr. W. S. THAYER (Baltimore) said that coronary prognosis was rather better than was thought at first, and was the key to treatment of the condition. Here the practitioner could do a great deal. One of the most important things that Osler taught was the necessity of rest under treatment of all sorts of maladies, but in coronary disease it was vital for two reasons: first because the patient's heart muscle often needed rest, and secondly because he needed to be adjusted mentally to his condition. This could only be done through a long period during which the doctor was labouring hard to make the patient understand his condition. The only way to train him was to put him to bed for many weeks. If he could be shown what could be done by rest and massage he could be trained so that he would live for many years.

Dr. ROBERT L. LEVY (New York) said that the more one took into account the pathological basis of the causation of cardiac pain, the less often was one inclined to speak of it as angina pectoris. He had been studying a group of patients suffering from "mild types" of coronary thrombosis. The severity of the onset varied, but the cases were mild in the sense that they made an unusually rapid recovery. From the point of view of the prognosis this was important, for it was found that it was not so much the intensity of the initial symptoms as the rate of recovery which served to indicate the ultimate outcome. The electrocardiographic changes observed were those commonly associated with acute coronary obstruction. In some of the cases a second attack followed the first after an interval of four or five years, and in one instance proved fatal. It was often difficult to persuade these patients to remain in bed for more than 24 hours because of the rapid disappearance of discomfort.

Dr. WARTHIN said that the essential pathology in all cases of angina pectoris was that of progressive anæmic infarction and fibrosis. The same pathology was found in the cases of angina having a previous history of syphilis. In these the affection was primarily a coronary one, with resulting infarction. In the cases of sudden death without a previous history of angina the pathology was chiefly that of a diffuse interstitial fibrosis, and not scarring due to infarction.

Dr. JOSEPH T. WEARN (Cleveland) agreed about the necessity for rest in coronary sclerosis. He had had several cases of complete occlusion of both coronary arteries as a result of syphilitic aortitis, and a great many cases where sclerosis had practically closed both coronary orifices. It was remarkable to note that in many of these cases the patient had had few, if any, symptoms of heart disease. Sclerosis was a slow process and syphilitic aortitis was a slow process. Both required months probably to close the coronary arteries. This lapse of time allowed the Thebesian circulation to enter the picture and take up its new duties as substitutes for the arteries. It was well known that many patients will become free from anginal attacks after prolonged rest when other methods have failed.

EXPERIMENTAL CORONARY OCCLUSION.

Dr. F. M. SMITH (Boston) pointed out that some cases of coronary occlusion were hard to diagnose by ordinary clinical means and in these electrocardiography might be of great assistance. The changes were frequently missed by not taking a curve early after the accident, or might not be recognised from

one record. He was much interested in Dr. Scott's finding that ligation of the descending branch of the left coronary might not be followed by alteration in the electrocardiogram unless it later increased the work of the heart. In his own work, the changes in the electrocardiogram were generally proportional to the extent of the disturbance of the coronary circulation. Ligation of the circumflex branch of the left coronary artery was thus followed by the greatest alteration in the electrocardiogram. The fact that Dr. Scott did not ligate the vein might make some difference in the results. The extent of the collateral coronary circulation of the dog varied greatly, and this must be taken into consideration. It would seem, however, that the ligation of either of the larger branches of the left coronary artery would produce changes in the electrocardiogram if enough disproportion was induced between the coronary circulation and the heart load.

Dr. W. G. McCALLUM (Baltimore) drew attention to the anatomical distinction between closure of the right and left coronaries. The right coronary was of greatest importance. On examination of the open artery the posterior half of the septum of the wall of the right ventricle behind the mitral valve was thin. It could be dropped into the cavity. In the left coronary, on the other hand, obstructive necrosis extended it at the narrow part of the septum at the apex, which caused aneurysm. The process extended through the right ventricle and gave rise to embolism of the pulmonary artery. The distinction was extremely sharp when seen at autopsy.

Dr. NORMAN M. KEITH (Rochester, Minn.) said that Barnes, Mann, and Markowitz of Rochester were reinvestigating the electrocardiographic changes resulting from ligation of various branches of the coronary arteries in dogs. It had been found that these changes did not parallel exactly the tracings obtained in man after occlusion of analogous vessels. On the other hand, it did appear that ligation of a branch of the right coronary artery producing infarction in the right ventricle caused electrocardiographic changes characteristically different from those obtained on ligation of the left coronary artery.

A NEW TECHNIQUE.

Dr. WILSON (Ann Arbor) said that the electrocardiographic changes associated with infection of the myocardium were related to the monophasic responses obtained in the physiological laboratory by placing one electrocardiographic electrode upon an uninjured and the other upon an injured region of the heart's surface. In the mammalian heart monophasic responses persisted for a few minutes only, although the electrocardiogram remained abnormal for a much longer period whose exact duration was uncertain. After the injured muscle died, of course, it no longer exerted an effect upon the electrocardiogram. During the last year new methods of studying the electrocardiogram had been devised which he hoped would throw new light upon interpretation. By taking præcordial leads, as well as the usual three leads, much additional information concerning the spread of the excitation process over the heart and also, he believed, regarding the final deflection of the electrocardiogram might be obtained. It was hoped that much information might be gained from such leads in coronary thrombosis. By measuring the area under QRS and also under T the normal relation between T and QRS and the variations of this relation in disease could be studied. By this method abnormalities of T might be recognised and studied quantitatively even when they were associated with changes in QRS—that is to say, he believed it possible to determine whether a given abnormality of T was or was not dependent upon an associated abnormality of QRS.

REVIEWS AND NOTICES OF BOOKS

Cottage Hospitals.

By Major F. M. DU-PLAT-TAYLOR, M.Inst.C.E., JOHN COLLERIDGE, F.R.I.B.A., and J. J. ABRAHAM, C.B.E., D.S.O., M.D., F.R.C.S. London: Ernest Benn, Ltd. 1930. Pp. 99. 12*s.* 6*d.*

THE authors of this book—an engineer, an architect, and a surgeon—have pooled their professional experience for the benefit of local authorities and others who may have to build and equip cottage hospitals. Obviously, within the compass of a small book, it has not been possible to deal at length with such subjects as administration, design and construction, X rays department surgical equipment, general equipment, still less with the cottage hospital as part of the voluntary hospital system. But since the style is terse, and padding is absent, they have contrived to supply a considerable amount of information. Cottage hospitals do not differ materially from the larger general hospitals. They are, in fact, models on a smaller scale of these institutions, but established in rural districts on much simpler lines with a matron as superintendent. They are primarily surgical hospitals, and their work has undoubtedly been much affected by the new conditions arising from the increase in motor accident cases. It is necessary, therefore, that such hospitals shall be designed and equipped for the purposes of a hospital; any offer of an existing building should be very carefully considered, since often it will be found that the cost of conversion is more than the cost of a new building designed for the purpose, and therefore more satisfactory.

Thirty-six pages are devoted to design and construction, a most important section of the book. Certain parts of the building are essential in all hospitals irrespective of size. For instance, corridors cannot be reduced in size, for, though the passing to and fro is much less than in a large hospital, the length of stretchers which must be wheeled out of rooms and turned remains the same. It is sometimes possible, however, by providing recesses at certain points for turning purposes to reduce the general width of corridors.

Apart from bed accommodation and the necessary auxiliary utilities, no cottage hospital can be considered complete unless it contains a properly equipped X ray department and an operating theatre, both designed on modern lines. The authors stress the importance of these departments, and it is, indeed, unfortunate that the majority of cottage hospitals are not yet so provided. Lack of funds is undoubtedly the reason, but having regard to the increasing number of major operations now being done in cottage hospitals, these two departments are really essential. Plans of three typical hospitals are appended, and these will be of especial interest to hospital committees. This book will interest those who have in mind the establishment of cottage hospitals, or indeed hospitals of medium size.

Radium and Cancer (Curietherapy).

By DUNCAN C. L. FITZWILLIAMS, C.M.G., F.R.C.S., Senior Surgeon, St. Mary's Hospital, Paddington. London: H. K. Lewis and Co., Ltd. 1930. Pp. 172. 12*s*. 6*d*.

"Radium and Cancer" is an attempt to outline Mr. Fitzwilliams's own experiences in radium therapy, the amount of the element at his disposal being limited; at the same time other methods than his own are discussed. The book opens with a very short historical and physical review, followed by a clear description of the various types of applicators, both of the element and emanation; the author prefers local implantation with needles or surface irradiation with a columbia paste applicator. Each organ liable to be attacked by malignant disease is considered in turn and the advantages of the various methods of approach are discussed together with an exposition of the author's technique and a few case-histories. The chapter on uterine carcinoma has been written by Dr. Malcolm Donaldson and is arranged on the same general lines as the rest of the book, but it has the advantage that other methods of treatment are discussed in greater detail, and statistics revealing the results of these as well as of his own methods are given.

Throughout the book Mr. Fitzwilliams describes the dosage in milligramme-hours, but in certain places he gives the expanded multiplication form (amount of element × number of days × number of hours), which is preferable, as it defines the all-important time factor. The book gives the impression of being somewhat premature; it might have been more profitable to wait until the results of the methods employed could be given. No statistics (save Dr. Donaldson's) are supplied, and the majority of the cases (40 in all) are of too recent date to estimate their success. No mention is made of post-operative care, follow-up schemes, or the treatment of recurrences. Mr. Fitzwilliams, following the French nomenclature, uses "Curietherapy" as a sub-title. This seems an arguable term. The Curies played no part in the original discovery of radium's biological properties (they have already gained eponymic fame in the millicurie, a more pleasantly sounding word). Further, were the term generally adopted in this country, it might suggest to the lay mind that radium was a "cure."

The book is fully illustrated, and all the diagrams demonstrating the position of needles in relation to the growth are excellent both in clarity and simplicity.

Athletics in Education.

By JESSE FEIRING WILLIAMS, A.B., M.D., Professor of Physical Education, Teachers' College, Columbia University; and WILLIAM LEONARD HUGHES, A.M., Professor of Physical Education, de Pauw University, Indiana. London: W. B. Saunders Company. 1930. Pp. 414. 14*s*.

IT is the aim of the authors "to draw attention to the tremendous educational possibilities of athletics properly conducted." Most of the book—actually two-thirds—deals with suggestions for the conduct of athletics; and an average reader confronted for the first time with so complex a system will be bewildered and amazed. In this country we are accustomed to treat the organisation of our sport in a far more casual fashion. There is no official, whether qualified medical man or retired athlete, who aspires to the title and position of director of physical education; but any such duties are usually gratuitously assumed by an active member of a team or some other good natured self-sacrificing amateur. Whether or no the elaborate scientific administration which this book describes would produce better results in this country, it is fairly safe to say that our tradition and temperament would always be antagonistic to its institution. Regarding themselves as ranking in dignity, responsibility, and service with other teachers, the authors justly demand appropriate recognition upon boards of control in which education in all its aspects is directed. To speak in appropriate language, one senses the atmosphere of personal grievance in the references to prejudices of old times persisting to this day and leaving the professor of physical education still socially *persona non grata*.

This work is essentially written by Americans for Americans. A bibliography of 85 pages, containing nearly 1000 references, includes no British and hardly a European contribution. Titles are suggestive of the part played by athletes in the social system; Are American athletics boss-ridden? Keep politics out of athletics; Are athletic coaches overpaid? Athletics are not a necessary evil; Sport as a socialiser. Diagrams of boards of athletic control are almost unlimited in comprehensiveness. Radiating from the central responsibility are such diverse branches as education, finance, hygiene, publicity, politics, and so forth. There is even provision for the "cheering section" with instructions when distinction must be drawn between extreme partiality and the more sportsman-like possibilities which such a section might display. The book will have only an abstract interest to students in this country. Our athletes could never be educated to accept such a degree of officialdom as the American system implies. Anyone who has had the experience of conducting an athletic programme single handed or with the aid of two or three inexperienced assistants must wistfully, if perhaps cynically, receive the information that to run a track meet a force of at least 50 officials is essential. A chapter on the medical control of athletics is excellent if rather condensed.

Shorter Convalescence.

By Lieut.-Colonel JAMES K. MCCONNEL, D.S.O., M.C. London: William Heinemann, Ltd. 1930. Pp. 132. 5*s*.

THIS is a small book with a large title. But it is, as Sir Robert Jones says in a prefatory note, "a valuable contribution to the physiology of muscular action and its relation to convalescence." There is no doubt that the exercises which the author recommends as appropriate in a large number of cases to the convalescent would minimise the period of weakness that must ensue after debilitating disease. A brief section entitled Types of Bed Exercises gives exactly the kind of information, where common types of recuperating patients are in consideration, which is required by the medical practitioner. The author claims that such exercises have an important effect on the mental outlook of the patient and thus aid his recovery; for in the performance of these manœuvres he realises that he can do something for himself, and introspection is diverted into useful channels. Moreover, the strengthening gradually of unused muscles preparatory to their full exercise after convalescence appeals to logical sense. Colonel McConnel has benefited by attachment to St. Thomas's Hospital and is able to quote clinical experience that this type of exercises has produced good results in patients of all ages, who, moreover, take a keen interest in carrying them out.

THE LANCET.

LONDON: SATURDAY, JULY 12, 1930.

HOUSING AND CHILD HEALTH.

THE House of Commons appears to be divided in its mind as to whether less houses are being built in 1930 than in 1929; Mr. KINGSLEY WOOD and Mr. E. D. SIMON contending that this diminution has occurred, Miss SUSAN LAWRENCE assured them that, though State-aided houses have declined in number, more houses are being built by private enterprise. Everybody seems to agree that the houses erected by public authorities are too expensive for the people most in need of them, and that our urgent requirement is to provide accommodation more within the paying capacity of the tenants who suffer from the heavy burden on their earnings. The type of dwelling to be supplied merits serious thought. The ordinary citizen is sometimes inclined to wonder for whom houses in this country are planned. Speaking at the National Conference on Maternity and Child Welfare held at Friends House from July 1st to 3rd, Mrs. SOMERVILLE, of Edinburgh, said that the vision behind the Housing Acts had been a desire to render possible better conditions of family life. Yet Mr. NEVILLE CHAMBERLAIN and Sir JOHN ROBERTSON both asserted that the needs of the younger generation are largely overlooked by those charged with the design and lay-out of houses, while Mrs. BARTON, of the Women's Co-operative Guild, was convinced that the last person to receive consideration when house-building is in question is the mother and housewife. Tenements and flats, if well-planned, have certain advantages, though Sir JOHN ROBERTSON would like to restrict them to families where there is no child below the age of 8 or 10 years; the architect of the St. Pancras House Improvement Society objects to the sky-scraper partly because, he says, "it has been found that children born in the upper storeys never come down to earth at all until they are 4 or 5 years old." A pertinent criticism was offered to the Conference referred to by Mrs. MAILLARD, of Penarth, who said that a local council, having discovered what it deems a satisfactory type of house, proceeds to erect all its houses on the same pattern, with the result that one side of the road is properly planned, and on the other both living-room and larder have the wrong aspect. This is an obvious difficulty to constructors, who none the less should find the ingenuity to get over its grosser features.

There is general agreement as to the deleterious effect upon child life of unsatisfactory living conditions. When, as medical officer of health of Birmingham, Sir JOHN ROBERTSON made his careful analysis of infant deaths dividing the city into zones, he found the infant mortality-rate rising by leaps and bounds as he progressed from the outer ring to the centre, where houses are both more closely packed together and more densely occupied. Upon analogous lines valuable evidence was forthcoming on the part of Mrs. SOMERVILLE, who for more than 20 years has been supplying to the Health Department fortnightly reports on the condition of babies born in one- and two-roomed dwellings in Edinburgh. Her investigation has included 30,000 infants, and the conclusion to which she has been led is that overcrowding is one of the most serious adverse forces against which child life has to contend. She made out an exceedingly strong case for placing the overcrowded family on the same level as the family living in a house condemned by the sanitary inspector. There is something strangely anomalous about the position when dwellers in condemned houses become an object of envy to their neighbours. Yet this can hardly fail to be the case when the dispossessed family is eligible for a Council house at an exceptional and uneconomic rent, while the family whose health may be suffering more as a result of overcrowding has no redress, and can only live in a Council house if the full rent can be afforded. Mrs. SOMERVILLE drew a vivid contrast between the 5000 condemned and the 1200 overcrowded houses in Edinburgh. Tenants of the former are being reinstated in Council houses consisting of two rooms and a scullery with individual bathroom and lavatory, at 5*s.* 11*d.* a week, or 7*s.* 6*d.* with an additional bedroom. On the other hand, she has personally applied, times without number, for families suffering acutely from overcrowding, only to be told that there is no rebate available under any Act of Parliament for such cases.

The problem is insistent all over the country, and voluntary housing associations formed for the purpose of tackling it, in small measure and in different localities, are arising in growing numbers, while those of older standing are constantly adding to their achievements. In Edinburgh 18 houses built by the Welfare Housing Trust were opened by the Secretary of State for Scotland last month. These houses consist of a large living-room and good kitchenette, three bedrooms, and an upstairs bathroom and lavatory, and they are let to families with four or more young children at a rent of 8*s.* 6*d.* a week, including rates. A playground has been provided, and each house has a fair-sized piece of ground of its own. It is hoped that useful data may be collected by keeping a careful survey of young children removed from one- and two-roomed houses to these better conditions. Fresh activity is reported from the Thistle Property Trust, Ltd., of Stirling, from Church Army Housing, Ltd., the St. Pancras House Improvement Society, and other bodies with similar objects, though it is distressing to read in a recent account from Manchester that "the rehousing of slum-dwellers is a problem that Manchester has not yet been able to tackle, except in the case of one small slum

clearance in 1923." All these schemes are giving fruitful help, but it is hard to endorse the opinion expressed by Lord BUCKMASTER in the House of Lords that voluntary aid is by far the most potent and important agency for the reconditioning of slums. When all successful voluntary ventures are put together they relieve no more than a fraction of the lower-paid wage-earners for whom better living conditions are an urgent hygienic necessity, to say nothing of the moral and social implications. The report on Housing Conditions in the Borough of Paddington, issued at the end of March by the Westminster Survey Group, frankly stated that :—

> The provision of industrial houses in Paddington on an economic basis is out of the question, and the task of the borough council is impossible of fulfilment unless and until public opinion accepts, not only in theory but in practice, the position that they must be built with public money and let at uneconomic rents—the deficit being defrayed either by the rates or by the taxes.

The statement frequently made with confidence and accepted apparently without misgiving—that the ratepayers' money must on no account be used for experimental work—explains why many of our vital social services have been initiated by volunteers, later to be assisted or adopted by the State when their value has received the unequivocal appreciation of the public. There is, however, some justification for the opinion that the usefulness of providing decent homes at a low rent has now been sufficiently demonstrated to lift the endeavour beyond the stage of experiment. The rehousing of the very poor is essentially a health question, and the suggestion of Dr. P. S. BLAKER, medical officer of health of Dudley, that the allocation of available houses should, under proper safeguards, be placed in the hands of local health committees is sound.

CORONARY THROMBOSIS.

AFTER long neglect in this country coronary thrombosis is at last beginning to arouse the interest it deserves. The description given by Dr. JOHN PARKINSON and Dr. D. EVAN BEDFORD [1] in 1928 brought its clinical features clearly before the profession, and in Dr. JOHN COWAN'S St. Cyres lecture, published last week, we have a further stimulus to study and research. He says that by far the commonest cause of myocardial fibrosis is interference with the blood-supply through the coronary arteries, and where this is sudden or complete the result may be a severe attack of anginal pain. Recovery from occlusion of a coronary artery was until recently considered rare ; the condition was looked on as a common cause of sudden death, although seldom identified outside the post-mortem room. But Dr. LEWIS A. CONNER'S report to the Association of American Physicians, as reported on p. 83, puts a different complexion on it. Of his 287 patients 45 per cent. are still alive and one of them has survived 17 years. Since in these cases prognosis is of the first importance his figures are noteworthy.

Knowledge of the electrocardiographic changes in coronary thrombosis is still sketchy, and it is not yet certain whether it will ever be possible to be sure which branch of the coronary artery is involved. It is now recognised that the changes shown in the electric tracing described primarily by H. E. B. PARDEE, and later by F. M. SMITH, J. T. WEARN, and others, are by no means always present ; in fact no changes at all may be noted after infarction. At the meeting in Atlantic City Dr. SMITH pointed out, however, that such changes are often missed because the patient is not examined soon after the accident or because only a single record is taken, and Dr. WILSON reported that a precordial lead gives much additional information about the spread of the excitation process over the heart.

Dr. HAROLD J. STEWART has attempted to correlate clinical and pathological findings by detailed study of individual cases.[2] In cases of occlusion of certain branches of the coronary arteries he tried to link up his findings with those of PARDEE, SMITH, and others, but was unable to do so except perhaps in occlusion of the circumflex branch of the left coronary, where a decrease in amplitude of the QRS complexes was observed. STEWART endeavoured to demonstrate the value of an accurate detailed record of a particular case as a means of correlating signs and lesions, but the difficulties of such correlation are many. As Dr. COWAN points out, J. S. CAMPBELL'S stereoscopic radiograms show how much the coronary arteries vary in distribution, and if the blood-supply from any part may be derived from different arteries the results of occlusion can hardly be constant. Moreover, as Dr. E. P. CARTER remarked in the discussion, the significance of the changes in the electrocardiogram depend on the rate at which the lesion develops. Nevertheless, an attempt should be made to collect cases where specific statements are made about the occurrence of pain and the exciting cause, and where information is available about the presence or absence of fever, leucocytosis, and friction rub, changes in the electrocardiogram, and detailed autopsy findings. Such records may make it possible to reach definite conclusions about the use of the electrocardiogram as an indicator of the site and extent of myocardial damage.

DENTAL RADIOGRAMS.

THE articles in THE LANCET of last week and in this issue by Mr. BOWDLER HENRY on the interpretation of dental radiograms, and the admirable illustrations which accompany them, deserve to be studied carefully by all practitioners. Even the dental surgeon, familiar though he may be with the technical aspects of the subject, is likely to learn something from the lucid descriptions of the radiographic appearances of the patho-

[1] THE LANCET, 1928, i., 4.

[2] Amer. Heart Jour., 1929, iv., 393.

logical conditions of the teeth and jaws. The doctrine of focal infection has brought dental sepsis into the limelight as a probable cause of many diseases, and has provided the doctor with a new remedy for intractable conditions which he he is eager, sometimes too eager, to apply. It has become a common practice among doctors to send patients to have the teeth radiographed. If the radiograms and the reports which accompany them seem to suggest the existence of infection in the teeth, then the patient is referred to a dentist for the appropriate treatment. This order of procedure has brought with it some unhappy results. Radiograms have their fallacies, as Mr. HENRY has well shown, and these fallacies are increased if the radiograms are technically imperfect. Their interpretation requires special knowledge of the anatomy and pathology of the teeth and jaws. The reports on a set of radiograms ought to be guarded even if the radiologist has special dental training, for as Mr. HENRY has aptly put it, "the radiogram is only one link in the diagnostic chain." Every dentist is familiar with cases in which the radiogram had provided evidence of dental infection not otherwise discoverable; he also sees cases in which the radiogram may be relatively favourable while the clinical evidence provides clear proof of an infected condition. A report made by a radiologist not specially versed in dental pathology may be very misleading. Among dental surgeons it is a commonplace of conversation, not often expressed in print, that radiographic reports in general have little value, though brilliant exceptions occur. Given a good set of radiograms, the dentist generally prefers to make his own interpretation of them, and he alone, as a rule, has the wide experience which entitles him to do so correctly. Mr. HENRY's articles are not intended to provide medical practitioners at one stroke with sufficient knowledge to interpret dental radiograms for themselves, to discriminate between conditions which are harmless and those which are not, to detect fallacies due to technical errors, and anatomical marks such as foramina simulating pathological lesions. Indeed, any doctor who takes upon himself the responsibility of passing judgment on the teeth and referring the patient to the dentist to act as executioner is likely to make serious mistakes, and, moreover, he puts members of the dental profession in a false position. The final assessment of the dental condition must remain the function of the dentist, though coöperation is necessary when a decision has to be made on the treatment appropriate to the particular patient of any dental sepsis which may exist.

There has been a widespread tendency both by doctors and dentists to assume that all areas of bony rarefaction round the apices of dead teeth are of equal importance and provide clear evidence of focal infection calling for drastic treatment. It is now beginning to be realised that this may not always be so, and that the presence or absence of sclerosed bone has considerable significance. The view originally put forward by WESTON PRICE, that the granuloma represents a barrier put up by the tissues against an infection in the tooth, and that it is "a periapical quarantine tissue," is gaining ground. Both the infection and the resistance are variables. A granuloma which at one time may be harmless because the quarantine is sufficient to hold the dental infection in check, at another time may be a danger because either the infection has increased or the resistance has diminished. Given a well-defined rarefied area with well-marked sclerosis around it, then, according to PRICE, the granuloma, though a potential source of danger, may not always be an actual one. Here lies the importance of studying the minute and intimate bone structure, which is only possible in radiograms of high technical quality. The days are passed when a hasty glance at a set of radiograms was enough to condemn or exonerate the teeth. As Mr. HENRY points out, a radiogram requires careful study under proper conditions of illumination and magnification by one who has knowledge of the structure of the teeth and jaws.

It must be admitted that the views of PRICE and his followers are not proven; they represent a working hypothesis which has much to support it, and for the present, at least, may be accepted. Unfortunately, there is still insufficient correlation between radiographic appearances and the morbid histology and bacteriology of the jaws, for the technical difficulties of associating all these findings in any given case are very great. At the present time the dentist may hesitate to allow teeth which have obviously been infected at some period to remain in the mouth, though the presence of a degree of sclerosing osteitis may suggest that the tissues have reacted successfully to the infection. In a serious condition, where the elimination of all discoverable infection is important, it may be wiser to regard all teeth with radiographic changes at the apices as sources of danger which should be dealt with drastically. But there is good hope that as our knowledge increases it may become possible to discriminate more certainly between dental lesions which are relatively harmless and those of high pathogenicity, and in this way to check the slaughter of functioning teeth which is now going on.

A point of great importance well brought out in Mr. HENRY'S articles is that infection may exist in the edentulous jaw. It is most important that a complete radiographic examination of the jaws should include the edentulous areas and that the absence of teeth should not be looked upon as making unnecessary a radiographic examination. The saw-like or feather-edge appearance of the alveolar border sometimes seen in edentulous jaws is a condition familiar to most dentists, and was recently described in THE LANCET by Dr. J. D. KIDD.[1] Not only does this residual infection lead to difficulty in the successful adaptation and wearing of dentures but, as Mr. HENRY has shown, it constitutes a focus of infection the more sinister because it is so likely to be overlooked.

[1] THE LANCET, May 17th, p. 1068.

ANNOTATIONS

CONAN DOYLE.

By the death of Sir Arthur Conan Doyle the medical profession loses a colleague whose name, though not for directly medical reasons, is more widely known throughout the world than that of any other member of the medical profession. Not even the Corpus Hippocraticum, with over 2000 years' start, has been sold in such profusion as the various volumes in which Sherlock Holmes appears; and though it is an open secret that Doyle regretted the way in which the popularity of the great detective had overlaid his creator's other claims to recognition as a man of letters, it is very real fame to have invented an eternal figure in fiction. Conan Doyle, who was born 71 years ago, was educated at Stonyhurst, and graduated in medicine in the University of Edinburgh in 1882. He practised for a time as a doctor at Southsea, made an expedition to the Arctic regions, and for a period aspired to the position of a specialist in ophthalmology in London but without obtaining a post at any hospital. He has recorded his experience in the neighbourhood of Cavendish-square as being made up of "a waiting room and a consulting room, where I waited in the consulting room while no one waited in the waiting room." This outcome of his ambitions made him turn to fiction as a means of livelihood, several varied excursions in that direction already having proved profitable. Among these early books was an admirable historical novel, "The White Company," published exactly 50 years ago. The knowledge and grip here displayed made it certain that works of a similar kind from his pen would have been successful, but the instantaneous popularity of the Adventures of Sherlock Holmes, which appeared as a serial the following year, exercised an influence over his literary career from which he constantly attempted to break away. "The Adventures" were at different times followed by "The Memoirs," "The Return," and "The Case Book," while in other well-constructed novels Holmes is the protagonist. Between their publication, however, there came from his pen an excellent novel of Regency days, other historical novels, and two books of distinctly medical interest—namely, "Round the Red Lamp" and the "Stark Munro Letters." Professional developments, altering the conduct of medical practice, may have made these two last books no longer topical, but they will repay reading for their observation of much that occurs now and much that lately formed routine. During the South African War Conan Doyle returned to the exercise of his calling and rendered the country excellent service; for he was senior physician to the Langman Field Hospital, while on the cessation of hostilities he wrote a history of the war in which, by tracing back the causes and reflecting on the conduct of the struggle, he attempted to place the true facts of the war before Europe. This book was translated into a dozen foreign languages and a large number of copies were distributed gratuitously, while the author received the honour of knighthood.

In the latter part of his life Conan Doyle threw himself with vigour into the promotion of the cause of spiritualism, and while many must have considered that his vivid imagination played too large a part both in his theories and in his acceptance of facts, no one doubted his deep sincerity.

TUBERCULOSIS IN EVERYDAY PRACTICE.

By a slow process of attrition the general practitioner has gradually been shorn of his opportunities in all those social diseases which for one reason or another have passed under State control. The late Dr. W. C. Rivers, a tuberculosis officer who knew the practitioner well from daily contact with him in an industrial area, has described him in "Through a Consulting Room Window" as sane and competent but disillusioned, the daily drudge of the panel system who in 30 or 40 years' time will give place to the salaried pensionable medical officer. At times, it is true, the general practitioner under the panel system would appear to have the worst of the bargain; but the horizon is changing and it is becoming evident that State schemes for social diseases lose half their value without him.

At the annual conference of the National Association for the Prevention of Tuberculosis, reported in another column, more than one speaker took this view. Dr. G. Lissant Cox remarked that the panel practitioner was not brought into the scheme of things nearly as much as he might be, owing to the unsatisfactory conditions under which he had to do his work. There was, he said, little time in panel routine for the long and careful examination of tuberculous patients, even if the practitioner was not handicapped by defective opportunities of training. Tuberculous patients were seen less and less frequently in the general hospitals; for the most part they went direct to a branch of the public medical service and were lost to the general teaching beds. Closer connexion was required, said Dr. Cox, between the tuberculosis dispensaries and the general hospitals if medical men were not to be sent out, as they were at present, knowing little of the signs and symptoms of early tuberculosis. Much depended on the good relations which ought to exist between the general practitioner and the tuberculosis service, and an important factor in this relationship was the quality of the work turned out by the tuberculosis officer. If the latter's administrative arrangements were so organised that his clinical work was of a low order, if he failed to undertake such specialised work as artificial pneumothorax treatment, it was futile to expect much interchange from him and his colleagues in general practice. Speaking as a practitioner, Dr. J. Cohen emphasised the same defects of the present system. When the patient leaves the sanatorium and returns to the care of the panel practitioner is the crucial moment of taking up his old life where he left off. In the scheme of divided responsibility, he said, it was easy for the practitioner to lose touch with the patient, and having lost touch to lose interest. The same story was being repeated in the case of venereal disease, antenatal work, child welfare, and juvenile rheumatism. Furthermore, the general practitioner as often as not knew little or nothing of what had happened to his patient during the stay in the sanatorium, and was therefore quite in the dark as to any special treatment which might have been applied. Pointing out that tuberculosis is being removed from the sphere of the medical student it followed that the practitioner might be unfamiliar with the present rapid advances in knowledge and technique and without the equipment to deal with tuberculosis when he finds it or when it is referred to him by the public authority.

To bring the tuberculosis officer and the general practitioner into closer touch presupposes mutual confidence. The tuberculosis officer must be a man of experience whom the practitioner can trust, and not just a migrant in the public health service. Unless he has the modern equipment of the tuberculosis specialist, the general practitioner is not likely to trust his skill. Public health committees have not yet come to realise that the treatment of tuberculosis is something more than the facile application of rest, fresh air, and good food; it involves the use of technical apparatus with a trained hand and mind. The practitioner also has much to give. There is knowledge yet to be gained on conjugal tuberculosis and marital infection, on pregnancy and tuberculosis, on relapses and recrudescences, on early signs and minor tuberculosis, on the causative factors in the acute, often fatal, forms of infantile tuberculosis, and the like, which can only be acquired in general practice. At the same conference Sir George Newman remarked that the Local Government Act of last year spells the end of the dual control of tuberculosis. Henceforth the public health committee which controls the tuberculosis service, called into being in 1912 as the result of the Astor Report, and the public assistance committee which now supersedes the guardians who controlled the advanced cases in workhouse, infirmary, and special ward and through out-relief, will meet under the roof of the same State authority. A new phase of the antituberculosis campaign is opening to which the practitioner has a contribution to make if he is allowed

MEDICAL MEDALS.

THE Brettauer Collection of coins and medals, which is a very famous one, and which is now in the possession of the University of Vienna, was made by Dr. Josef Brettauer of Trieste, who died 25 years ago. The circumstances in which it has since been housed, and why the cost of an illustrated catalogue has become a question of public appeal, will be found in a letter from the trustees for the upkeep of the collection which appears in another column (see p. 117).

The collecting of medals and coins is justified by the value of the tokens in confirming history, while affording an opportunity for the display of beautiful art. The coin and the medal have no exact differentiation, for the ancient coins, while representing money of a certain value, have had often, on the reverse, an illustration of some historical event. For example, there is a Byzantine coin whose reverse shows the Virgin Mary supporting the walls of Constantinople, a résumé of the history of that date which is very significant, while similarly a gold coin of Edward III. (a noble, worth about 8*s*. 6*d*.) commemorates on the back a victory over the French. It seems that the coin having a particular value in currency no longer "features" historic episodes, this rôle being left to the medal, which is struck to commemorate some event or person, and has no place in the currency. To this class belong the medals struck during the English Civil War, and the Christian token of Pope Gregory XIII. recording the festival or massacre of St. Bartholomew. The Brettauer Collection contains a complete group, in many subdivisions, of medals referring to the art and practice of medicine, and the field here is a large one. Those who have seen Mr. Forrer's catalogue of the collection of Greek coins belonging to the late Sir Hermann Weber, who began his fruitful labours through interest in medical medals, may recollect how fully medicine was represented. A rare drachma of Epidaurus, for example, has on one side the head of Apollo the father of Asklepios, and on the other Asklepios with his hand extended over his serpent, while beneath his throne is a dog. Mr. S. W. Grose, writing in THE LANCET with reference to the Weber catalogue, called attention to coins showing Epione, the wife of Asklepios, and the instrument known as the cupping vessel. The cupping vessel is on other Greek coins, especially those deriving from Thessaly, another centre of the worship of Asklepios. This town was the reputed home of Cheiron, the wisest of the Centaurs, and renowned for his skill in medicine. On the coins of Tricca, the legendary birthplace of Asklepios, appear an interesting type of Asklepios feeding his sacred serpent with a bird. Such are the prizes that arouse the antiquarian, but throughout the history of medicine great men, large events, and private generosity have been represented by numismatic art, and a graceful example of the last is furnished by the endowment at Corpus Christi College, Cambridge, by Dr. S. A. M. Copeman of an annual medal for medical research.

It is to be hoped that the trustees of the Brettauer Collection will obtain the practical help they need.

SENILITY AND HIGH BLOOD PRESSURE.

THE ætiology of high blood pressure, excluding cases which can be put down to chronic renal disease, remains obscure. The old belief that the blood pressure inevitably rises as age increases is a fallacy which dies hard. C. Laubry and R. Castéran [1] point out the importance of distinguishing between old age, a physiological condition, and senility, a pathological state, and recall the dictum of Vaqeuz that the vascular changes in the aged are due less to age than to the pathological conditions appertaining to age. They cite cases of men as old as 90, in whom the blood pressure was found to be well below the normal adult level. They have also observed that people exposed to hypertensive influences during their working years not uncommonly have a lowered blood pressure after retirement. This observation is readily understood if high blood pressure is regarded as a manifestation of cardiovascular hypertrophy in response to continuous or intermittent hypertensive influences. If the influence is removed before the vascular changes have gone beyond the stage of physiological hypertrophy, the blood pressure may fall again; but once this stage is passed a permanent rise is necessary to force the blood through the rigid and often narrowed arterial bed. It follows from this that in patients with high blood pressure and grossly degenerated blood vessels attempts to lower the pressure by violent means, such as purgation, are not merely illogical, but may cause a dangerous and even fatal

[1] Rev. de Méd., April, 1930, p. 251.

ischæmia of important tissues such as the myocardium and the brain. The physician, therefore, has no call to focus the attention either of himself, or still less, of his patient on the blood pressure reading. If there is much vascular, cardiac, or renal degeneration he should confine his treatment to the use of iodides, cardiac tonics, or diuretics, respectively. When the arterial degeneration is not excessive, however, no harm is likely to follow the use of purgatives, low-salt diet, or venesection, and such measures often relieve symptoms. Removal of the underlying cause is, of course, the ideal. That it is sometimes difficult to attain is illustrated by a case recently reported by F. Trémolières and P. Véran,[2] of a man of 28 who suffered from repeated attacks of herpes zoster, accompanied by severe headaches, vomiting, and amaurosis, and occasionally by clonic convulsions. During these attacks the systolic blood pressure rose as high as 280 mm. Hg, and the urine contained albumin. At the end of the attack the blood pressure fell to 130 mm. Hg and the albuminuria ceased. Later on the blood pressure became persistently high and death occurred, less than 12 months after the onset of symptoms, from failure of a hypertrophied heart and secondary degeneration of the kidneys. The association of herpes and hypertension in this case suggests that obscure nervous influences may play some part in causing paroxysmal and even permanent increase in the blood pressure.

DIFFERENTIAL BLOOD CULTURE IN SINUS THROMBOSIS.

AN ingenious method of blood culture, introduced by Reuben Ottenberg,[3] seems likely to yield useful information in certain cases of mastoid disease and sinus thrombosis. Quantitative blood cultures are made simultaneously from the two internal jugular veins and from one of the limb veins. In cases of lateral sinus thrombosis differences in the degree of bacteræmia may be detected in the blood in the two internal jugulars, and this may give information of clinical importance. The simple presence in either of the jugulars of a bacteræmia much greater than that found in the limb blood points to an intracranial venous infection, and a quantitative difference between the two sides points to unilateral sinus thrombosis. The side of the infection is not indicated, however, by the result of the blood culture, since upon blockage of the sinus the blood flow is reversed by inflow from the smaller collateral channels, while blood from the region of the thrombus may also reach the opposite jugular by more circuitous routes. The passage of organisms into one or other jugular is also determined by their distribution in the thrombus. Either they may be escaping into the blood stream in large numbers from one or other end of an infected thrombus or they may be more or less completely immured in comparatively uninfected propagated clot. But although these somewhat numerous complexities prevent a differential culture from determining the side of the infected sinus, a difference in the bacteræmia indicates with some certainty the presence of such an infection, and its exact locality is usually indicated by other signs. The question arises, in what proportion of cases of thrombosis is such a positive result obtained? Ottenberg obtained a definite positive indication in 10 out of 20 cases of proved sinus thrombosis or phlebitis,[4] and in the same series of cases of proved thrombosis the results were negative five times. A negative culture, therefore, does not exclude its presence.

The method has a further sphere of usefulness in cases where mastoid disease is complicated by osteomyelitis, pneumonia, or endocarditis, and it is especially difficult to diagnose an associated sinus thrombosis. Here an excess of bacteria in the jugular blood over that found in the systemic blood gives valuable information in pointing to the latter, and, conversely, where the results are essentially the same the likelihood of the sinus being at fault is reduced. The work reported is extremely interesting and may prove of value in diagnosis, but as Ottenberg clearly recognises, there are certain limitations and possible sources of fallacy. For example, the speed of elimination of organisms from the blood stream and variation and irregularity in their rate of transfer to it must be considered; and also the important question of post-operative bacteræmia. It is recognised that after operation bacteria can pass into the blood from septic areas and appear in cultures made from the related veins without any interruption of convalescence. Ottenberg suggests that the principle upon which his report is based may be extended to other regions of the body.

HERPES ZOSTER AND ENCEPHALITIS.

THE association of zoster with encephalitis is rare. In a recent paper Netter [5] described 16 cases, details of which he had been able to collect, and from a consideration of this material he concluded that these were examples of encephalitic lethargica in which zoster was a complication. It is, of course, well known that injury to the first sensory neurone predisposes to invasion of this neurone by the zoster virus—the so-called symptomatic zosters—and it is possible that Netter is right in thinking that the virus of lethargic encephalitis may occasionally prepare the way for a zoster infection. But an examination of the published details of Netter's cases makes one doubt whether he is entitled to place this interpretation on all of them. In one patient there was an interval of six years between the onset of encephalitis and the appearance of zoster, and in two others, one of which was observed by C. I. Schiff and W. Russell Brain, the zoster eruption actually preceded the encephalitis. Schiff and Brain report their case on p. 70 of our present issue, and at the same time they review the literature. In their opinion, cases of encephalomyelitis with zoster fall into three groups. One group consists of those in which the occurrence of the two conditions is a mere coincidence, a second group comprises cases of encephalomyelitis complicated by a symptomatic zoster, whilst the third and most interesting constitutes a true zoster encephalomyelitis. It is in this last group that Schiff and Brain would place their own case. Encephalomyelitis is recognised as a complication of many diseases due to filtrable viruses, and there seems no reason for doubting that the same holds good for zoster infections also. There is a considerable body of evidence, both clinical and scientific, pointing to the identity of the viruses of chicken-pox and zoster, the latter being a neurotropic variation of the former. Zoster is a posterior poliomyelitis and it is easy to understand how the virus

[2] Presse Méd., May 31st, p. 787.
[3] Jour. Amer. Med. Assoc., 1928, xc., 1602.
[4] Ibid., June 14th, p. 1896.
[5] Netter, A., Bull. et Mém. de la Soc. méd. des Hôp. de Paris, May 9th, 1930, p. 793.

could spread to adjacent portions of the central nervous system with the production of a meningo-encephalomyelitis, the type of which would be determined by the distribution of the zoster infection. A meningeal reaction has long been recognised as a constant feature of zoster and occasionally the signs and symptoms of meningitis are present. In support of their conception of a zoster encephalitis Schiff and Brain point out that in the cases which they would put in this category, meningeal symptoms are a prominent feature and often show a local predominance corresponding to the distribution of the zoster. The demonstration of the virus of zoster in the cerebro-spinal fluid of their case lends support to this view.

ABOUT DELIRIUM TREMENS.

AT a meeting of the Society for the Study of Inebriety, held at the rooms of the Medical Society of London on Tuesday last, Dr. E. F. Wills, resident medical superintendent at Rendlesham Hall, described his personal experiences with sufferers from delirium tremens. The main question with which he dealt, as a clue to treatment, was whether the sudden withdrawal of alcohol is a factor in the onset of the delirium. Fairly admitting that this sequence of events has been flatly denied by certain authorities, he detailed instances, which had come under his own observation, showing that delirium is more likely to manifest itself when alcohol has been abruptly discontinued. He further explained the occurrence of delirium tremens in association with shock or surgical interference as an example of the same phenomenon, believing that when such cases are closely investigated the real factor determining the symptom will be found to be the withholding of alcohol up to at least the amount which the patient had been previously imbibing. Therefore he holds the immediate bar to all alcohol to constitute incorrect treatment, advising that, together with the appropriate narcotics and purges, alcohol in "tapering" doses should be exhibited.

Dr. Wills's paper concluded with the comforting statement that the number of cases of delirium tremens is on the decline in this country in response to the raised price of alcohol and the shorter hours during which its public purchase is sanctioned by law. This was a simple and practical communication.

MUCOUS MEMBRANE IN THE SKIAGRAM.

RADIOGRAPHY of the stomach and duodenum is passing into a second stage of its development. In the first stage the stomach was filled with the opaque meal and the state of the lumen was thus made apparent. In the second stage, for which we are indebted to the pioneer work mainly of Akerlund, Forsell, Holzknecht, Schwarz, and Berg, interest may be said to have been transferred from the lumen to the wall itself, the investigation being directed to the contour of the mucous membrane. While the former method is of value in determining size, shape, tonus, and peristalsis, the latter is a considerable refinement where organic disease is concerned. A. Rohrbach[1] gives a full account of the technique he uses which closely resembles that recently described in our columns[2] by V. J. Kinsella, and attributed by him to J. O'Sullivan. Only half a tablespoonful of the barium meal is given and it is important that this should be of maximal surface-tension and free from particles. This small amount is observed on the screen and by suitable manual compression it is made to fill the furrows of mucous membrane, leaving the intervening ridges bare. Films are taken with Berg's well-known apparatus. Normally the mucous folds should appear as parallel lines of uniform width; a radial arrangement indicates the present of an ulcer at the point of convergence. The main advantages of this over the earlier method are that by varying the degree of compression the presence of multiple ulcers can be determined, that ulcers can be seen on the anterior and posterior surfaces when their craters do not project in profile from the lesser curvature, and that information is given regarding the degree of inflammatory thickening of the mucous membrane surrounding the crater. The method is also of service in the investigation of carcinoma. Atrophy of the mucosa, as in pernicious anæmia, and the inflammatory changes of gastritis are also well brought out.

[1] Med. Klin., 1930, xxvi., 469.
[2] THE LANCET, 1929, i., 1130.

A HOSPITAL SWEEPSTAKE.

THE particulars of the first sweepstake to be organised in aid of the Dublin hospitals were published last week. Six hospitals are to share the profits—namely, Jervis-street, Sir Patrick Dun's, National Dental, National Maternity, Children's (Harcourt-street), and St. Ultan's. A sum of £25,000 is guaranteed for distribution in prizes, but the promoters hope that, as the result of the sale of tickets, they may have an amount at their disposal of at least four times that sum. Of the total receipts, 80 per cent. will be distributed in prizes, the other 20 per cent. covering the expenses as well as the profits for distribution to the charities. The sweepstake will be on the November Handicap, and the draw will take place on Nov. 17th, in the Mansion House, Dublin. It is clear that, unless the sale of tickets goes beyond expectation, the promoters must be content with a comparatively small sum for the benefit of the charities.

CONSTITUTION OF HUMAN MILK.

EXACT information about the constituents of human milk at all periods of lactation is important for the preparation of artificial foods for infants. Much attention has been paid to its composition during the first month, but after that there has been a gap. We therefore welcome new observations, just published by workers at the Royal Free Hospital[1] and elsewhere, on the milk of 51 women attending welfare centres. It appears that the calcium content is lowest for the first two weeks of lactation, rising gradually to a maximum during the first four months; it maintains a fair level after the fourth month, but slowly decreases. The rise in the proportion of calcium coincides with the time when the baby is increasing its intake of milk by the largest daily amount, while the subsequent decrease will be balanced by the supplementary foods that the child will take about the age of six months. The proportion of phosphorus runs parallel with calcium up to the end of the fourth month, but then remains almost constant. This, it is suggested, may be because growing soft tissues need more phosphorus than calcium. The ratio between the two elements is of great importance in the ætiology of rickets, and this study indicates that during the first six months of life a ratio of CaO to

[1] Widdows, S. T., Lowenfeld, M. F., Bond, M., and Taylor, E. I.: Biochem. Jour., 1930, xxiv., 327.

P_2O_5 per 100 c.cm. of milk greater than 1, and approximately 1·3, is probably most suitable for the child, provided the vitamin factors are adequate. Sugar is at its lowest value in early milk, but by the end of the first month the proportion has risen to an average which remains at about 7 per cent. of lactose throughout lactation. The low values for sugar in early milk are interesting when we consider the very general use of highly sweetened food in the artificial feeding of young infants. The highest percentage of protein proved to be in the first three days after parturition; the level then fell steeply during the first week to reach an approximate average of 1·4 per cent. at the end of the thirteenth day. A gradual decrease takes place to just under 1 per cent. during the last month of lactation, but this is counterbalanced by the larger volume of milk consumed. Most authorities give 1·5 to 1·6 as the usual figure for protein, but perhaps the percentage varies a good deal. In cases where there was a pathological condition of the breast the percentage of sugar in the milk was found to be low.

GROUND ITCH OR WATER SORE.

WHAT is ground itch? Most practitioners in the tropics would probably answer that it is a dermatitis of the feet attacking barefoot coolies who paddle about in mud infected with ankylostoma, and is caused by the larvæ boring through the skin and irritating it. The term has, however, become a popular designation for all kinds of dermatitis of the feet, and therefore misleading. For example, in Florida 320 people complaining of ground itch had only one case of ankylostoma infection among them, but 30 kinds of skin disease. Hence Prof. F. Fülleborn of Hamburg had reason for feeling that the published accounts of the disease ground itch require critical discussion. The disease, he says,[1] was first described by W. E. Lloyd Elliott in 1900 as *pani-ghao* (water sore), characterised by itching blisters of the feet, especially between the toes and affecting barefoot labourers in the Assam tea gardens. It has since been reported from Bengal, China, Queensland, the West Indies, and elsewhere, always in people who wade or paddle in mud more or less contaminated with human fæces, and frequent in proportion to the extent of this contamination. Ankylostoma infection and ground itch are often reported together, by coincidence. Ground itch is not heard of in dry Egypt, nor is it reported from the porous volcanic soil of Guatemala or Sumatra where ankylostoma is very prevalent. It has indeed been set up by applying ankylostoma larvæ in mud to the forearm, but only if the mud contained human fæces. It is probably of microbial origin—it is cured by salicylic acid—though its cause is as yet unidentified. Fülleborn, after careful examination, expresses a hope that the term ground itch will no longer be employed in medical literature, and that henceforth the disease should always receive the name suggested by its discoverer—namely, pani-ghao or water sore.

OVER £8200 has been received towards the proposed memorial to Sir Patrick Manson (see THE LANCET, 1930, i., 142). Further donations will be gratefully acknowledged by the President of the Royal Society of Tropical Medicine and Hygiene, 11, Chandos-street, London, W.1.

[1] Was ist Grounditch? Arch. f. Schiffs- u. Tropen-Hyg., March, 1930, p. 133.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. T. Creaser to be Surg. Capt.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. (D). W. H. Hume to *Victory*, for R.N Hospital, Haslar; Surg.-Lt. R. Erskine-Gray, to *Pembroke*; Proby. Surg. Sub.-Lt. G. S. Thoms to *Victory*, for R.N. Hospital, Haslar.

ROYAL ARMY MEDICAL CORPS.

Twenty-five permanent commissions in the Royal Army Medical Corps are being offered to qualified practitioners, under 28 years of age, registered under the Medical Acts. There will be no entrance examination, but candidates will be required to present themselves in London for interview and medical examination. At the same time, a certain number of temporary commissions under similar conditions as regards age and qualifications will also be offered. Applications should reach the War Office not later than July 20th. All information as to conditions of service and emoluments may be obtained from the Under Secretary of State, The War Office (A.M.D.1), Whitehall, London, S.W.1.

Lt.-Cols. N. D. Walker and G. A. K. H. Reed retire on retd. pay.

The undermentioned Majs. (temp. Lt.-Cols.) to be Lt.-Cols.: T. C. C. Leslie, vice Lt.-Col. S. M. W. Meadows, promoted, L. G. Gibson, vice Lt.-Col. N. D. Walker, and T. T. H. Robinson, vice Lt.-Col. G. A. K. H. Reed, to retd pay.

The undermentioned Majs. to be Temp. Lt.-Cols.: A. C. Amy, W. Mitchell, and E. Gibbon.

Lt. T. F. M. Woods to be Capt.

ARMY RESERVE OF OFFICERS.

W. D. Speedy to be Lt.

TERRITORIAL ARMY.

Capt. L. M. Weeks to be Maj.

Supernumerary for Service with O.T.C.—Capt. A. Fowler to be Maj.

Lt. J. F. Fraser to be Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. G. B. Gill, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Capt. B. Stewart, from Active List, to be Capt.

ROYAL AIR FORCE.

Group Capt. H. V. Wells to be Air Commodore.

Wing-Comdr. H. W. Scott to be Group Capt.

Squadron Leaders R. S. Overton and D'Arcy Power to be Wing Comdrs.

Flight.-Lt. W. S. Stalker to be Hon.-Squadron Leader.

RESERVE OF AIR FORCE OFFICERS.

Flight.-Lt. T. L. P. Harries relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE.

Lt. K. Rai to be Capt.

Lt.-Col. J. W. McCoy retires.

GOOD SERVICE AWARD.

The Secretary of State for India has approved the grant of a Good Service Award to Maj.-Gen. Sir C. C. Manifold, K.C.B., C.M.G., I.M.S. (retd.).

COLONIAL MEDICAL SERVICES.

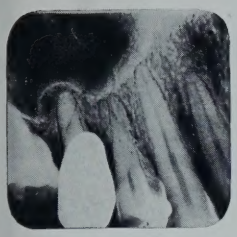
The following appointments have been made: Maj.-Gen. H. P. Barrow, Health Officer, Leeward Islands; Miss A. E. Connan, Lady Medical Officer, Straits Settlements; and Dr. W. P. Jones, Medical Officer, Malaya Medical Service, Straits Settlements.

THE death occurred in London, on July 5th, of Dr. Gavin Brown Clark, sometime Member of Parliament for Caithness and Sutherland. Dr. Clark, who was in his 84th year, qualified at Edinburgh in 1874 and was for many years resident physician to the Dunblane Hydropathic Establishment.

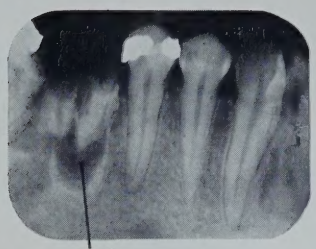
ST. BARTHOLOMEW'S HOSPITAL SURGICAL WING.—On Friday last the Lord Mayor of London formally opened the new surgical wing. A service of dedication was conducted in the Paget ward by the Bishop of Chester (Dr. H. L. Paget), a son of the late Sir James Paget, surgeon to the hospital. An illustrated description of the wing and its equipment was published in our last issue.

MR. C. BOWDLER HENRY: INTERPRETATION OF DENTAL RADIOGRAMS.

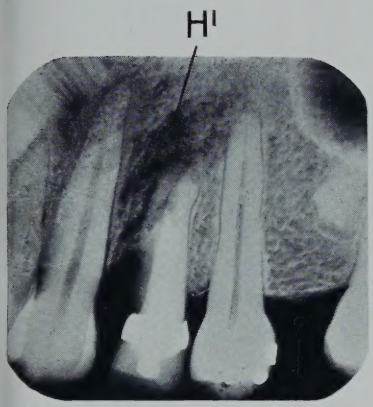
XIV



XV. A



XV. B

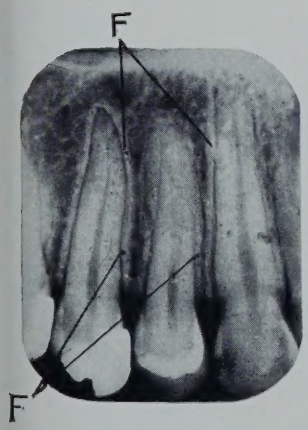


XVI. A

XVI. B

XVI. C

XVII. A



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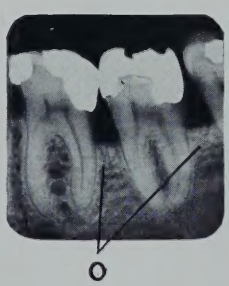

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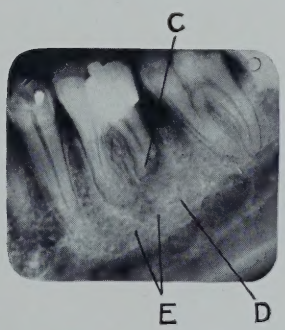
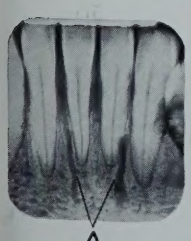


XIX

XX. A



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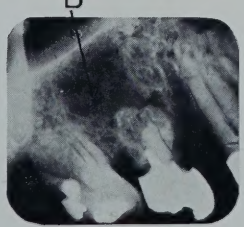

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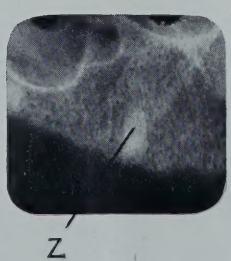

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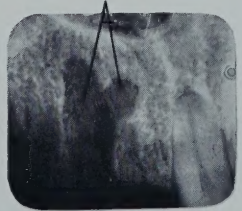

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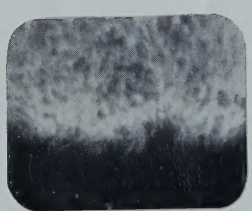
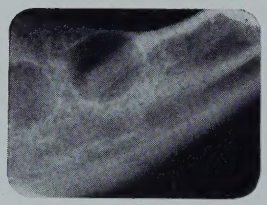
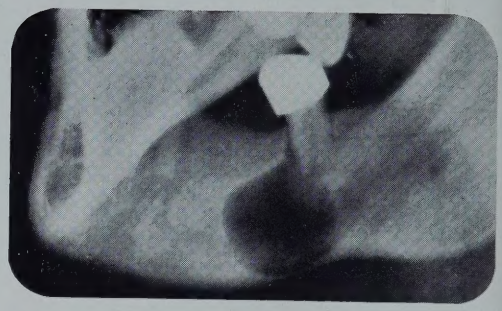


XXV. A

XXV. B

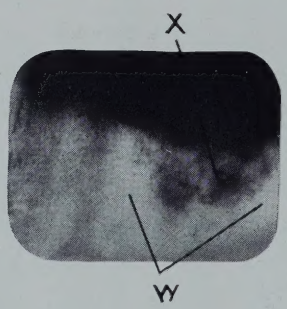


XXV. C



XXVI

XXVII. A



XXVII. B

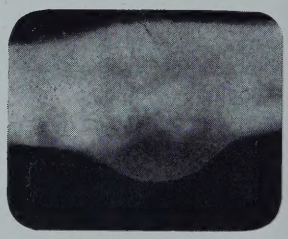


FIG. I

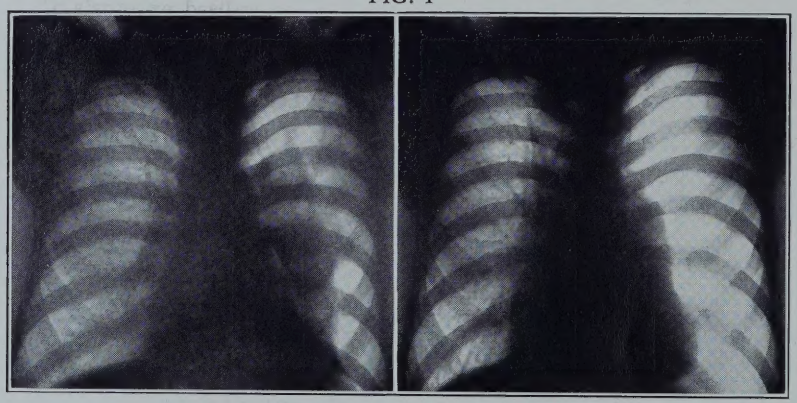
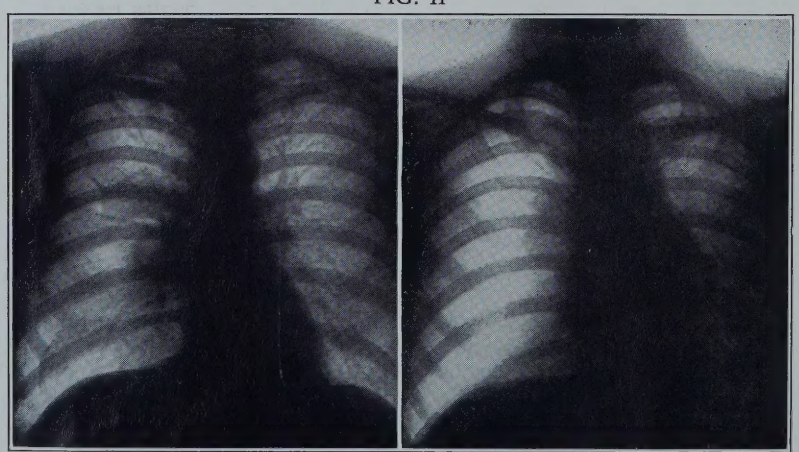


FIG. II



DR. MAURER:
Adhesions and Artificial Pneumothorax.

Fig. I. Radiograms illustrating the result of artificial pneumothorax before and after operation by the method of Jacobaeus.

Fig. II. Similar radiograms in a case in which the adhesions could only be dealt with by means of the combined cautery.

CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS

(A Series of Special Articles Contributed by Invitation.)

LXXX.—INTERPRETATION OF DENTAL RADIOGRAMS.

(WITH ILLUSTRATIVE PLATE.)

PART III.*—Apical Infection.

As has already been stated, this does not reveal itself in a radiogram until the products of its putrefaction of the pulp have changed the normal picture of the surrounding tissues. (The electric test for pulp vitality and stereoscopic radiograms are of value here in differentiating the affected teeth.) When apical infection of the chronic type has taken place, the apex of the root is seen to be surmounted by a rarefied area, there being a breach at this point in the lamina dura. The area of bone destroyed varies in size from a small crescentic cap (Fig. XIV.) to a cavity the size of a filbert nut, apparently involving adjacent teeth. The outline of the radiolucent area is of importance. Where it is clearly defined, even and hard, the contents in the bony space are usually a pus sac which often comes away attached to the root during extraction (Fig. XV., A). When the outline is indefinite, irregular, and soft, no true demarcation from rarefied area to normal bone can be seen. The one merges into the other. This space will be found to contain a mixture of pus and granulation tissue, or solely granulation tissue, constituting the "apical granuloma" (Fig. XV., B). The importance lies in the fact that although the former appears in a radiogram as a blacker and more obvious area, it is probably less harmful. It is seen when resistance against the septic invasion is good, and is often surrounded by an area of sclerotic bone. The granuloma appears to be present in cases when the infection is gaining ground. Since it is more friable than the fibrous capsule of the pus sac, the granuloma does not readily come away with the root, and it tends to persist as a focus of infection, even after the removal of the tooth.

Unlike the circular smooth-lined cavity of the chronic abscess, the cavity of the granuloma is mostly loculated. Undoubtedly the open operation which consists in removing the tooth and deliberately enucleating the granuloma is to be preferred to ordinary extraction.

A number of these operations reveal a certain inadequacy of the radiogram to show the full extent of a granuloma, for it is sometimes found that under the shelter of a rather dense alveolar plate rarefaction apparently confined to the apex of one tooth has spread through the cancellous tissue of the interdental bone and involved adjacent teeth.

Patients who develop the circumscribed type of apical rarefaction are mostly young, and the septic area may be harboured for years without apparent damage to other organs; whereas the granuloma occurs later in life and is associated with poorer resistance and secondary symptoms.

A set of dental radiograms of an adult patient in whom a number of teeth have been devitalised may easily show both black abscess areas and greyish granulomata side by side.

A patient of 60 years with a tooth showing a chronic abscess enjoyed good health for many years, annual radiograms showing the area to be of constant size and demarcation. (Fig. XVI., A and B). A final radiogram showed the septic area to have broken bounds, the outline of the cavity becoming blurred and extending on one side (Fig. XVI., C). This was followed shortly by cardiac disturbance of toxic origin, which has not recurred since the tooth was removed.

Sclerosing Osteitis.

Emphasis has been given to the phenomenon of sclerosis in these infections because of its diagnostic and prognostic importance.

It is seen, affecting the bone more or less uniformly, as an accompaniment to the generalised exostosis of the roots in those cases of low-grade infection where resistance is good (Fig. XIII.). Localised, it is seen first as a thickening of the lamina dura (Fig. XVII., A), and later as a fleecy patch around a mildly septic tooth or surrounding an area of apical rarefaction, and it may be deposited in response to constant trauma to buttress the root of the tooth which is subjected to undue strain, such as one supporting a bridge. It is present in the interdental tissue as a natural barrier to further rarefaction (Fig. XVII., B) and its formation is stimulated by suitable treatment.

* Parts I. and II. appeared in THE LANCET last week.

DESCRIPTIONS OF ILLUSTRATIONS ON SPECIAL PLATE.

PART III.

FIG. XIV.—Apical infection. Crescentic area of rarefaction bulging into the floor of the antrum, showing the ease with which that sinus may become infected from a septic tooth.

FIG. XV.—(A) Apical infection. Clear definition of the dark area (H) suggests an abscess sac containing pus.
(B) Area H' at apex of crowned premolar undefined and fading gradually into normal bone indicates a granuloma.

FIG. XVI. (A, B, and C).—Showing chronic abscess G, clearly defined in 1926 (XVI., A). In 1927 it was rather larger but still well defined within a smooth white wall (XVI., B). In 1928 the abscess has spread to the neighbouring tooth and has a hazy irregular wall (XVI., C).

FIG. XVII.—(A) Sclerosis of lamina dura (F).
(B) Sclerosis (O) in the interdental tissue.

FIG. XVIII.—Sclerosing osteitis (D) occurring as a zone round a dead molar. Note areas of apical rarefaction (E), and some absorption of one root (C).

FIG. XIX.—Sclerosis changing to rarefaction. The areas between the teeth are progressively more radiolucent from left to right of the film.

FIG. XX.—(A) Rarefying osteitis accompanied by "streaking" (A), commonly seen in the lower incisor region.
(B) Rarefying osteitis (B) shown as a radiolucent (dark) area with hazy outline.

FIG. XXI.—Typical specimen of the dental film of one of the cases of residual dental sepsis quoted. Observe the insignificant appearance of the residual root (Z).

FIG. XXIII.—Persistent socket (Y) due to sclerosis in the surrounding bone and infection in the socket.

FIG. XXIV.—Enlarged film of alveolar ridge showing residual infection producing a condition of non-healing rugged edges with constant shrinkage of the ridges and soreness under the plate due to spiculation.

FIG. XXV.—(A) Early dental cyst—almost spherical—surrounded by normal appearing bone from which it is separated by a thin though clearly marked layer of compact bone.
(B) Two small dental cysts in the edentulous mandible like the one in the previous figure (XXV., A). Simple extraction does not suffice. The cyst must be removed by open operation, otherwise it will continue to grow.
(C) A larger cyst of the mandible beginning to lose its spherical form and to spread in the direction of least resistance.

FIG. XXVI.—Very large dentigerous cyst formed around an impacted third molar and extending from near the root of the canine tooth in front rising in the ascending ramus almost to the notch.

FIG. XXVII.—Subacute osteomyelitis of the mandible. Note sequestra embedded in granulation tissue (X) and surrounded by a dense area of sclerosis in the bone. Sequela to the removal of teeth for periodontal disease. (A) Vertical film; (B) horizontal film showing swelling on buccal aspect of the jaw.

The presence, therefore, of a condensing osteitis in moderation is a good sign, for it demonstrates that at the time when the radiograms were taken the system generally was reacting favourably against the invasion, and these cases are often suitable for conservative treatment. At times sclerosis takes place to an extreme degree, and localised patches of uniformly radiopaque bone are seen extending some distance from an affected tooth into the medulla of the jaw beyond (Fig. XVIII.). In other cases the local and general resistances become impaired and rarefaction supervenes upon the sclerosis (Fig. XIX.). Devascularisation of the area, which accompanies the sclerosis type of reaction, is a disadvantage from both a pathological and a surgical point of view. The greater the condensation the more removed is the nidus from the phagocytic elements of the soft tissues. Cases are on record where metastatic lesions have persisted long after extraction of the teeth, only to be cleared up when the sclerosed bone itself was removed.

From a surgical aspect, excessive sclerosis, which is usually accompanied by hypercalcification and increased brittleness of the teeth, not merely offers mechanical difficulty to the removal of the teeth but, where ordinary extraction is the procedure, the necessary trauma and consequent "bacterial shower" are greater. Also, owing to the impaired blood-supply, the socket heals with difficulty, is easily infected, and is a familiar dental sequela to the operation of extraction known as "dry socket."

If the cancellous tissue be examined critically at some little distance from the source of infection, small dark (radiolucent) spots are frequently seen, each surrounded by a ring of sclerosed bone. These areas cannot be adequately reproduced in a print of a radiogram but are clearly visible on a viewing box. It has been suggested [1] that these areas represent colonies of living bacteria, and evidence of their infectivity is deduced from the facts that (*a*) they are found in clusters around infected teeth; (*b*) they occur in the interdental septa where marginal rarefaction is taking place; (*c*) they may be seen also in the bone from which teeth known to be septic have been removed months previously. Their appearance in the edentulous bone invariably means residual sepsis which can be shown bacteriologically.

Heath [2] has found that when they are present interference with the tooth (e.g., extraction) has consistently been followed by a fairly acute systemic reaction with an increase of the secondary symptoms. The fate of these small dark spots depends on the patient's resistance. (1) They may heal—producing the little sclerotic spots which provide evidence of past infection overcome. (2) They may remain in statu quo ready to break out when the body's resistance is lowered by some other agent—e.g., overwork, old age, intercurrent disease. In this way residual dental infection may persist for years after the removal of all the teeth, and may produce secondary symptoms, such as arthritis. (3) Resistance being poor, these dark spots may spread and coalesce, giving rise to the condition of caries in the bone—one form of the rarefying osteitis dealt with below (Fig. XX., B).

Rarefying Osteitis.

When the conditions of bacterial virulence and bodily resistance are unfavourable, a rarefying osteitis is observed. This condition may be seen on the margin of the destructive lesion, or deep in the medullary tissue. It is characterised by a removal of the lime-salts, with accompanying lack of brilliance in the radiographic shadow of the osseous network, so that the area has the appearance in the negative of having been painted with a reducing agent (Fig. XX., A). When an area like this is not surrounded by sclerosed bone, it fades away gradually into the normal tissue. The condition is often seen between and below the apices of lower incisor teeth as hazy radiolucent streaks (Fig. XX., B), seemingly indicative of the drainage of septic material from around these teeth into the body of the jaw. The same condition may be observed in the maxilla in the incisor and premolar regions extending around and beyond the roots of infected teeth, but here it is more diffuse and less easy to detect (Fig. XX., B). It may be rendered more obvious, however, by increasing the illumination and regarding the films at some distance, and it is usually well brought out in positives carefully made upon printing-out paper, but not when bromide paper is used. In the dried specimen it may be seen as a zone of osteoporosis surrounding the cavity of a granuloma.

This phenomenon signifies the unobstructed diffusion of sepsis through the cancellous tissue, and demonstrates the gradual dissolution of large areas of bone. It is seen in more recent infections, and is found in patients, often young, suffering from rapid periodontal disease accompanied by loosening of the teeth and extreme debility. When the teeth are extracted, the bone, which is being replaced by inflammatory granulation tissue, feels soft and mashy. Cases revealing this condition have little resistance to the infection, and are usually ill as the result of it, and therefore careful radical treatment is indicated.

Residual Infection.

Except in the young and vigorous it is difficult to say with what efficacy infection, once it has gained access to a jaw, is ever removed. Bacteriological examination of the apices of extracted adult teeth are rarely sterile. Where there is one septic tooth in a jaw contamination of the roots of other teeth appears to ensue. In those few cases of this type where it has been feasible to extract a second tooth clinically and radiographically sound—in one case, in fact, on the opposite side of the jaw—and under conditions calculated to avoid extraneous contamination, the same organism has been grown from the root of the sound tooth as from the septic one. The conclusion to be drawn from this is that the bone of the jaws does not easily recover from dental sepsis; the longer septic teeth remain in the jaw the less chance the patient has of complete recovery from infection after their removal. Two cases recently came under my observation, both rheumatic—one with the knees so badly affected that walking was almost impossible, and the other with fixation of the right elbow. Both patients exhibited radiological evidence of residual dental sepsis, while a complete medical overhaul revealed no other obvious source of toxæmia. Streptococci in pure culture were obtained from the medullary portion of the jaws of both patients, and following treatment of the dental sepsis the affected joints recovered (Figs. XXI. and XXII.).

It is not uncommon to see patients still suffering from focal dental toxæmia when the jaws have been edentulous for ten or more years. Where tooth fragments are left behind the chances of complete disappearance of infection are still further reduced, and the practice of ignoring these pieces is culpable. Jaws edentulous so far as external appearances are

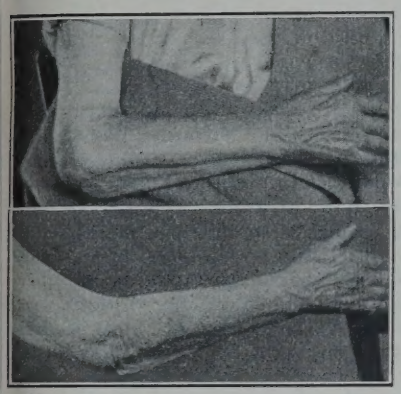
[1] Colyer, S.: THE LANCET, 1922, i., 175.

[2] Heath, J. S. R.: The Correlation of the Radiographic Bone Pathology of the Jaws with the Incidence of Secondary Infections, Dental Cosmos, September, 1923.

concerned denote nothing. There may be buried roots, misplaced teeth, or areas of rarefaction invisible to clinical inspection. In every case of focal sepsis a full set of dental films should be taken and there is much to be said for the growing practice of checking the success of dental operations by further radiographs after a selected lapse of time.

Radiographically, residual sepsis is shown as a persistent area of apical rarefaction or as a patent (i.e., non-ossifying) tooth socket persisting after the gum has healed over it, and constituting a type of granuloma, or as a diffuse area represented by small dark spots and streaks (Fig. XXIII.). It appears also in cases of periodontal disease where recuperation has been poor, or sometimes as an area of diffused rarefaction localised in the alveolar margin, or as a general and progressive shrinkage of the alveolar ridges, especially in the mandible, which (when the film is examined closely with a lens) may present a saw-like edge due to spiculation (Fig. XXIV.). Clinically, the symptoms of this are progressive loosening of artificial dentures—some patients requiring a new denture each year—and a chronic soreness under the plates due to the pressure of mastication trapping the mucosa over the roughened surface of the bone. Buried teeth and impacted lower third molars and other misplaced teeth appear to become infected sooner or later, and it is wiser that they should be removed early whilst the bones are soft and vascular than that they should be left till the sclerosis of the bone and brittleness of the tooth complicate the operation or until gross rarefaction imperils the recovery from infection. A devitalised tooth with the root canals efficiently filled and no pathological signs in the bone may not be a harmful tooth, but it is at least a suspicious one, and both it and the patient's health picture should be watched accordingly. A far greater responsibility is undertaken in advising its retention than its extraction.

FIG. XXII.



Edentulous patient, aged 68, who had complained of pain, swelling, and immobility of the elbow-joint for two years. Removal of some buried root fragments for cultural examination produced but slight relief. After eight weeks' pause the residual infection was treated by intra-oral diathermy and weekly doses of autogenous streptococcal vaccine. After ten weeks' treatment the pain had ceased and the range of movement greatly increased. Since this time (two years ago) the recovery has been maintained, and the patient has full use of her right hand, previously functionless.

Dental Cysts.

The radiographic appearances of dental and dentigerous cysts are somewhat similar. The difference lies in the fact that a dental cyst is found in relation to the root of an infected tooth or one with a past history of trauma, and may persist in the jaw years after extraction of such a tooth; whereas a dentigerous cyst is found in connexion with a vital unerupted tooth, whether normal or supernumerary, which it may enclose partially or entirely.

In a negative a dental cyst appears as a very clearly defined radiolucent area involving the apices of one or more teeth (Fig. XXV., A, B, and C). The bone cavity, which this radiolucent area depicts, is seen to be surrounded by a solid, cortical light line, and the bone beyond is of healthy appearance. The outline is clearly defined and regular. In its earlier stages a cyst is more or less globular, but with growth it tends to bulge in the direction of least resistance.

DENTIGEROUS CYST.

Cysts of this nature develop around the crown of an impacted normal (Fig. XXVI.) or supernumerary tooth. In examining the radiograms of developing teeth, the crowns of the forming teeth are seen to be enclosed in a capsule of bone. A dentigerous cyst is formed by the proliferation of the epithelium lining this chamber and its consequent distension by the fluid of degeneration. Mostly the fibrous tissue sac which encloses the epithelium is attached firmly to the neck of the tooth, with the result that radiograms show the crown only projecting into the radiolucent area. In later stages, however, extension toward and around the apex of the root may be such as to enclose the tooth entirely.

Other types of odontoma are less frequently observed.

Diffuse Osteomyelitis and Necrosis.

Fortunately, owing no doubt to the good blood-supply, infections from the teeth nearly always remain localised. When, however, the relative conditions of infection and local resistance permit it, spreading takes place along the marrow spaces of the bone. A large area is involved and a condition of osteomyelitis results. In the acute form the clinical evidence is conclusive. In the subacute and chronic types, radiographic examination is useful to watch the progress.

In the earlier stage there is a generalised rarefaction over the area and the cancellous spaces appear enlarged. Later, channels are formed which extend along the bone and give a worm-eaten appearance. Pieces of bone which are cut off from nutrition become necrosed and in advanced cases sequestra are formed. These can be seen as islands of bone entirely surrounded by a dull (radiolucent) "shadow." During healing new sequestra are frequently formed, causing more or less disturbance and discomfort, and should be removed after location by fresh radiograms. Subacute cases (Figs. XXVII., A and B) may persist for months without causing the patient more than soreness, and in neglected cases the bone may become weakened to the point of fragility. In one case recorded, spontaneous fracture of the mandible in the molar region occurred before the patient presented himself for treatment. The jaw was fractured at night while he was lying on the affected side of the face.

Impacted Teeth and Foreign Bodies.

Only a small percentage of unerupted and impacted teeth develop cysts of the follicle. Their importance, however, lies in the amazing variety of complaints, other than dental, to which they give rise. Current dental literature is full of examples where removal of the impacted tooth has led to immediate and complete cessation of symptoms. When the teeth were healthy the secondary symptoms were mostly of the reflex nervous character. Undoubtedly some cases of neuralgia, such as one excited by impaction of the upper third molar against the tooth in front of it, are due to resorption of the dentine of the latter and irritation of its pulp, but often it is the impacted tooth

itself which causes the trouble. The teeth most frequently misplaced are the third molars, the canines, and the second premolars, upper and lower.

Lastly, the possibility of the presence of supernumerary denticles and of foreign bodies should not be overlooked. Usually there is a history of accident such as a broken hypodermic needle. Occasionally, however, during the extraction of several teeth, a metal filling or a fragment of enamel may be dislodged from a tooth and escape into its own open socket or an adjacent one, where it may remain. This foreign body, if overlooked, may cause only local or even no discomfort afterwards, but perhaps years after the accident secondary symptoms may occur.

I have to thank Dr. W. H. Coldwell for the negatives from which Figs. XXV., C and XXVI. were made. Fig. III., C is taken from an article on "Nasmyth's Membrane and Periodontoclasia" by Kurt H. Thoma.† Also I have to thank Mr. Owers, of the Kodak Company, for help in preparing the illustrations for reproduction.

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† Journal of Dental Research, 1926, vi., 7.

SPECIAL ARTICLES

MEDICINE AND THE LAW.

Irregularities at Inquests.

THOSE who do not wish to see the coroner's inquest abolished must anxiously watch judicial criticisms of its procedure. Bench and bar regard the inquest with less reverence than is felt by laymen. They look upon it as a clumsy archaism and to some extent an unnecessary duplication of criminal procedure. Members of the bench notice the informalities and the divergences of local usage due to the strong personal authority of the coroner. Members of the bar know the tribunal as one where there is no right to address the jury and where even the examination of witnesses is a concession. Two recent cases in the King's Bench Division have revealed irregularities sufficiently grave to lead to the quashing of the inquisition. In both cases the judges have repeated with emphasis the dictum, to which Lord Reading and Lord Hewart have given currency, that it is not enough that justice should be done; it is not less important that justice should seem to be done. In other words, the outward forms of judicial procedure are not to be ignored. In particular, if a jury is summoned and is called upon to declare its verdict, the verdict must be based upon the evidence given in open court with no other assistance than the summing-up of the coroner himself.

AN INQUISITION QUASHED.

On June 17th the Divisional Court quashed an inquisition taken before the coroner for Hertfordshire at North Mimms upon a death caused by a traffic collision. The ground on which the court interfered was that the coroner's officer, who was also a witness, was present with the jury during their retirement. The court accepted his statement that he did not speak to anyone in the jury room, and also the coroner's statement that he was unaware that his officer was with the jury. But the judges regarded the irregularity as fatal. The coroner's officer, an official whose existence is nowhere recognised by statute but whose services are frequently conspicuous at the inquest, evidently requires careful watching. Other irregularities, in part arising from looseness of procedure in respect of jurymen when not in open court, vitiated an inquest at Kingston-upon-Hull earlier in the present year in circumstances reported in THE LANCET of Feb. 22nd (p. 426). Two men had been killed in a traffic accident and the inquest resulted in a verdict of manslaughter against a motorist. The first of a series of alleged irregularities was that the coroner had viewed and discussed a damaged vehicle before the inquest in company with a man who afterwards acted as foreman of the jury. The Divisional Court accepted without reserve the coroner's statement that at this viewing of the vehicle no discussion of the causes of the accident took place. There was, said Mr. Justice Talbot, ample opportunity for discussion and, even though an inquest might be an inquiry less formal or rigid than a criminal trial, it was contrary to public policy that a coroner should take, before an inquest was held, one or more persons who were to serve on the jury, and privately investigate with them any of the facts of the case with or without discussion. The judges thought that what had happened would have amounted to misconduct on the part of the coroner even at common law and that they would have been justified on that account in quashing the inquisition. The judges, however, had powers in addition to their powers at common law. They could take action under Section 6 of the Coroners Act of 1887, if it were "necessary or desirable in the interests of justice." The judges considered that nothing should be allowed which made it certain that the jury would be influenced by things which they had seen or heard outside the court; it was clear that the coroner's visit to the garage with the man who became the foreman of his jury must have had this effect. Earlier in the judgment Mr. Justice Talbot had criticised the practice at Hull of summoning a coroner's jury from a total panel of only 16 or 17 persons. The court felt bound to say that to confine the area of selection to so small a number in so large a town seemed very objectionable. The principle of the jury system was the determination of questions of fact by persons taken at haphazard from the body of qualified persons. To have a small panel of "regular jurymen" was an entire departure from that principle, and the practice had brought about the irregularity already described. In spite of the Divisional Court's opinion, it would seem that the judges were here on no very sure ground. Although it is common to use the voters' list as a list of jurors, Parliament has deliberately preserved (in Section 52 of the Juries Act of 1825, read with the saving clause in Section 45 (5) of the Coroners Act of 1887) certain ancient and rather vague usages in respect of coroners' juries. The coroner seems to have a free hand provided that he obtains the attendance of the statutory number of qualified jurymen. When the great Lord Mansfield was laying the foundations of the commercial law, it is said that he liked to employ the same little band of experienced merchants as his special jurymen at the Guildhall to determine points of commercial practice. There seems, therefore, no inherent harm in habitually enlisting the services of a small group of jurymen—at any rate for a coroner's jury where the juror's oath indicates that the jury's traditional functions are not quite the same as in

other tribunals. Coroners, however, will note that the King's Bench Division condemns the practice of restricting the panel of jurors. A second irregularity alleged in the Kingston-upon-Hull case was that the coroner joined the jury in their inspection and discussion of the damaged vehicle without allowing any of the parties to be present, and that he allowed a police constable to speak to the jurymen and to point certain matters out to them. The judges were of opinion that, while of course the jury were entitled to view the vehicle, and while the coroner was not doing anything wrong if he went with them, it was probably better that he should not. If he did go with the jury, he should carefully abstain from discussion of the case with them. The Hull coroner put in a sworn statement that he had so abstained and the judges accepted the statement. They did not take a serious view of this alleged irregularity; in particular they said that the complaint that other parties were not admitted to be present at the visit to view the vehicle had not been made out. In any case the coroner was not bound to admit them; it was a matter for his discretion. There was a third irregularity which the Divisional Court regarded as substantial—namely, that the police constable, who had already given sworn evidence in court as to the speed at which a particular motor-car was travelling (the one most material issue in the case), should have been allowed to give supplementary evidence to the jury outside the court. This the Divisional Court found to be a valid reason for quashing the inquisition for reasons very like those given in the North Mimms decision where the coroner's officer, also a witness, had accompanied the jurors in their retirement. A man against whom a verdict of manslaughter was ultimately returned by the coroner's jury would, said Mr. Justice Talbot, naturally feel that he had not been fairly treated if—as apparently happened—the foreman of the jury asked him questions obviously based on information obtained outside the court. One final allegation of irregularity was disregarded by the Divisional Court. It had been complained that the coroner was at fault in not reading over to the witnesses his notes of their evidence before they signed. On this point the judges observed that no doubt if a coroner thought there was any uncertainty as to what a witness had said, or if the witness requested it, the deposition ought to be read over, and the witness might be justified in refusing to sign until it was. But the statutory requirements are definitely stated in Section 4 (2) of the Act of 1887: the coroner is to put in writing the material parts of the statements made on oath, and both the coroner and the witness are to sign. The Divisional Court felt it had no right to add another positive requirement to those which Parliament had enacted.

A LOCUS CLASSICUS.

As was explained in our previous account of the Kingston-upon-Hull case, fresh evidence was disclosed after the first inquest. On this account alone the Divisional Court could, and did, order a new inquest last February, the second inquest being held in an adjoining division and resulting in a verdict of accidental death. Not content with this ground for quashing the inquisition, the Divisional Court decided to examine somewhat elaborately the various allegations of irregularity, which they found themselves able to do without making any reflection upon the coroner. Their decision is likely to be a *locus classicus* to which reference will be freely made in future. As the facts relate to practices in respect of which many coroners might regard themselves as having complete discretion, they deserve study. Taken together, the Kingston-upon-Hull and North Mimms cases are a warning that inquest procedure must conform, to a greater extent than was previously perhaps deemed necessary, with the orthodox methods of a criminal trial. The well-established popularity of the coroner's inquest might not protect it from the destructive consequences of a series of similar attacks suggesting that both the forms and the spirit of justice have been neglected.

Sale of Poison from Automatic Machine.

While revision of the law governing the sale of poisons still hangs fire, an important decision has been given in the Wood Green county court on the sale of bottles of lysol from an automatic machine. A friendly test action was brought some time ago by the Council of the Pharmaceutical Society against Harry Ronald Watkinson, a member of the Society, outside whose shop was an automatic machine containing such bottles. The bottles bore Mr. Watkinson's name and a statement that they contained 50 per cent. of cresol; they were labelled "Poison." The Society's contention was that an automatic machine is not a qualified chemist and that sale by such machine is consequently an illegal carrying on of the business of chemist and druggist. The Society naturally upholds the principle that it is undesirable that the public should have ready access to poisons without the supervision of a qualified chemist; the point is important in view of the greatly expanding use of automatic machines. The defendant conceded that the sale fell within his general supervision but was not within the particular degree of supervision requiring the purchaser to sign the poisons book. In May Judge Crawford reserved judgment; on June 26th he delivered judgment at Edmonton, holding the sale to have been illegal. The defendant, he considered, carried on the business of a chemist and druggist through the medium of an automatic machine, through which he sold to the public a dangerous poison. "In my judgment any other conclusion would be most unfortunate in the public interest." The judge was satisfied that any child tall enough to place a coin in the slot and take a bottle of lysol could do so without the knowledge of the defendant or any of his employees. "Beyond all question this ought not to be allowed to continue." The analyst's evidence had been that the bottles contained over 47 per cent. of homologues of carbolic acid. No supervision, said the judge, had been exercised over the sale. "The sale of such a dangerous poison as lysol certainly ought to be part of the business of a chemist and druggist rather than of any other trader." The court inflicted the statutory penalty of £5 with costs.

It is at first sight surprising to find a penal action of this nature taken in the county court. The machinery for recovering penalties is laid down in Section 12 of the Pharmacy Act of 1852 as "by plaint under the provisions of any Act in force for the more easy recovery of small debts and demands." Section 15 of the 1868 Act applies the 1852 Act machinery to the recovery of penalties under the later statute. On the general question of supervision of sales by persons having special professional training and qualifications it seems clear that, if Parliament requires such supervision as a necessary precaution, sale by a Robot is a breach of the law. The official volumes of criminal statistics (of which the volume for 1928 was recently published) do not give any serviceable figures of the number of crimes where poisoning is suspected or proved. The public, however, is aware of cases of poisoning, not always brought home to the criminal, where some readily obtained substance of the weed-killer type was apparently employed.

THE MARIE CURIE HOSPITAL.

THIS hospital was officially opened on Thursday in the presence of a distinguished gathering. The hospital, whose arrangements were fully described in our issue of March 8th (p. 527), is the outcome of a clinic started by the London Association of the Medical Women's Federation in 1925, in order to provide radium treatment for women suffering from cancer, particularly uterine cancer. Its chief aim is to advance knowledge of the methods of treating cancer by means of clinical research; close coöperation between a group of surgeons and the scientific staff is assured by the appointment of a research officer as director. The accurate record and study of results is the only means by which a trustworthy body of evidence can be built for future guidance; it serves also as the basis for modifications in technique. Sir Walter Fletcher, whose official position has given him special opportunities of following the progress in detail of radium treatment, has stated that nowhere in Great Britain is there available any series of results on such a scale properly recorded and extending for such a series of years as these. It is, he said, imperative in the national interest that observations, so well begun and continued, should be maintained and developed in order that treatment may be guided in the light of an increasingly secure foundation of ascertained knowledge.

The Marie Curie Hospital, which is staffed entirely by medical women, is now treating more cases of cancer of the cervix per annum than any other clinic in England; the number is, in fact, as large as those at present treated at the Fondation Curie in Paris, or at Radiumhemmet in Stockholm. The total number of these cases treated since the clinic was started is over 440. The method of technique which has, apart from minor modifications, been practically the same from the start, was described in detail in a report published last year.

At present there are only 30 beds in the hospital, but plans have been prepared for an addition which will be built when funds are available. The new wing is designed to provide more accommodation, including an X ray department and additional pathological laboratories. Our illustration gives a general idea of the building as it now is.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

A PUBLIC HEALTH POLITICAL PARTY.

A NEW organisation has just appeared on the horizon. It calls itself *Parti Social de la Santé Publique*. What makes one take it seriously even at this early stage are the characters of its president and secretary-general, Justin Godart and Dr. Georges Schreiber respectively. The latter is already well known in France for his tireless advocacy of the periodic medical examination in all walks in life. The appeal he has just sent out to the public to rally to his party is doubtless well suited to our mentality, so different from yours. The Englishman when he wishes his appeal to the masses to be really effective, says he is addressing every thoughtful and far-seeing person. Dr. Schreiber dispenses with flattery. He is abusive instead. He says:—

"The Frenchman, to be candid, has not, as a rule, the taste for hygiene. He has no more taste for it to-day than he had 30 years ago for exercise and sport.... The organisation of our public health services throughout the country is radically faulty. Our hygienic defences are only in an embryonic stage, our public health staff is much reduced and our public health budget is simply ridiculous."

The programme of this new *Parti Social* includes: (1) the inculcation of the taste for hygiene just as the taste for sport has been inculcated in the French nation; (2) agitation for legislative reforms in the field of public health; (3) creation of a budget corresponding to the public health needs of the nation; (4) provision of a properly equipped public health organisation throughout the length and breadth of France. With reference to this last item on the

programme, it is pointed out that as many as 23 departments possess no public heath organisation whatever, and that most of the others have such an organisation in only a most rudimentary form. The means whereby the party hopes to attain its ends include education of the public—notably at the time of the elections—the exercise of pressure on the members of the legislative and executive bodies, and roping in of the press.

B C G AND THE PASTEUR INSTITUTE.

The Pasteur Institute has issued to the press a communiqué about the Lübeck disaster, allocating the blame therefor in the following terms. "The French and foreign press have, in connexion with the Lübeck drama, given great publicity to the notion that the preventive tuberculosis vaccine, prepared by the Pasteur Institute and known as B C G had caused the death of many infants from tuberculosis in this town. It is proved by official investigations made by the Government of the Reich that these deaths are due to a fatal error of the laboratory of the municipal hospital of Lübeck which has substituted virulent cultures of tuberculosis for the harmless B C G. It is therefore necessary that everyone be informed that the B C G vaccine of Calmette and Guérin has nothing whatever to do with the matter, and has no responsibility for these accidents."

MEDICINE AND LITERATURE.

No one knows in France how many doctors there are who, having satisfied their examiners in medicine, have ceased to practise it and have turned to some more congenial and less arduous métier. We do not pay much heed to these apostates unless they distinguish themselves. Why should we? We know we have our potential novelists and poets, and we wait till the potential or incubation stage is over before we rush to claim them as long lost brethren. We have done this just lately in the case of Georges Duhamel to whom the "Forty Immortals" of the French Academy have allotted its "Grand Prix" for literature. It is, perhaps, unfair to speak of apostasy from medicine in his case, for the war showed him to be an excellent surgeon as well as an almost uncannily clever writer. He is most prolific—almost as prolific as Galen himself, but let us hope with a saner literary offspring. Among the best known of his works are "Le voyage à Moscou" and "Scènes de la Vie Future."

A WOMAN'S APPOINTMENT.

The recent promotion of Madame Bertrand-Fontaine to the staff of the public hospitals in Paris has been hailed as a new and signal triumph for the French woman. So it is. Other women will doubtless enjoy the same success from time to time in proportion as they deserve it; since the appointments are subject to the scrutiny of an open competition, the best man or woman (more or less and little accidents apart) should get them. Madame Bertrand-Fontaine's career, recorded in the *Siecle Médical*, has already been quite distinguished in spite of a digression into matrimonial life. The mother of two children, and aged only 34, she was appointed a hospital "externe" in 1920 at the first competitive examination after the war. Appointed "interne" in 1921, she worked successively under such leaders of the medical profession as Aglave, Hartmann, Ménétrier, Widal, Boidin, and Paisseau. Without having abandoned the highway of general medicine, she has devoted special attention to diseases of the kidneys, in the study of which she has been greatly helped and inspired by Widal. She has, in fact, started well.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

STATE CARE OF CHILDREN.

THE present municipal authorities of Vienna are Socialist, and it is interesting to note what they are doing for the welfare of children; the governing principle is "*produktive Fürsorge* (productive welfare work), not charity," and the aim is to turn out useful members of the community. Herbert Spencer has said that the education of a child begins 20 years before its birth, and in Vienna this theory has been acted upon. Apart from antenatal care a course of lessons in the hygiene and management of infants has been started for women and girls in a populous part of the city. The pupils practise on dolls until they have attained enough ability and knowledge to be trusted with live babies. For confinement women are sent to one of the maternity clinics or gynæcological wards, all of which are splendidly equipped and run by the municipality or the State. After the birth of the child, mother and offspring remain only a few days in the ward, and are then taken to a *Kinderheim* (children's home), where both are well looked after. Every new-born child is entitled to a complete outfit, which is furnished by the municipality free of charge. Breast-feeding is encouraged in every instance, especially in the *Kinderheim*. When mother and baby leave for home, she is obliged to bring it up for observation every month. If she has to work for her living and cannot trouble about her baby, a home is found for it, either with private people, who are supervised by welfare officers, or in one of the municipal institutes. When the child attains school age its care is entrusted to school doctors and specially trained welfare sisters, called *Fürsorgerin*. The general medical examination of the school child takes place as a rule in the first, third, fifth, and eighth years of its school life. The teeth are examined every three months at the school dental clinic, where also the child is taught to clean its teeth regularly. In the same way the school oculists look after eyesight, whilst periodical examination by the general medical adviser makes it possible to correct faults of general health.

Special care is taken of illegitimate children. Every child born since 1912 and having no legal representative—in other words, whose mother is not married—is taken under the guardianship of the *Jugendamt*, or official welfare centre for juveniles. These boards look after the interests of all the children born in Vienna until they have attained full age. The welfare worker, who is usually a young woman, has to see the child once a month. She has to report to the *Jugendamt* at least twice a year about the child, and is expected to supervise its health and make sure that it is not cruelly treated. One of the chief objects of the guardianship is to ensure the regular payment of an affiliation allowance fixed by the courts. In this country the father unwilling to pay may be imprisoned if the *Jugendamt* complains to the ordinary court.

"Productive welfare work" extends also to the child after his fourteenth year. As a rule, it is sent after leaving the public school to the *Berufsberatungsamt*, or advisory board for occupation. Examination of his mental and physical abilities gives a clue to vocation. Artisans and apprentices remain under the supervision of the *Jugendamt*, and there are legal restrictions of the duration and amount of work to

be expected from them. The maximum is eight hours a day, with no night work, and they must attend once a week for a whole day in apprentice schools, where they learn a trade. For at least two weeks yearly every juvenile occupied in a trade is sent to a recreation home.

TRACHEOMALACIA IN GOITRE.

At a recent meeting of the Wiener Gesellschaft der Aerzte Dr. Sgalitzer demonstrated a number of cases of a dreaded complication of goitre—namely, softening of the tracheal wall caused by pressure on the windpipe, with consequent atrophy of parts of the tracheal cartilage. Sometimes the walls of the trachea may give way and suffocation follows. The condition is not usually diagnosed promptly by the laryngologist, but X rays show that the lumen of the softened trachea is altered on coughing or sniffing. This method of examination under different pressures also gives satisfactory results in less obvious cases of diminished resistance of the tracheal wall. To know that the trachea is soft is very important when operating for goitre. With this knowledge the surgeon can operate with the tracheoscope in situ, or can do a preliminary operation. Examination of patients several years afterwards shows that tracheomalacia persists after operation, but there is relief from stenosis, and breathing is free. The lumen is usually normal or but little narrower; sometimes the trachea is even distended. Examination under different pressures shows increased motility of the walls, because the cartilage is not regenerated. The firm scar tissue acts as a support and prevents collapse of the walls.

In the present state of our knowledge, said Sgalitzer, it is necessary to study the condition of the tracheal wall in every case of goitre. It is just in the doubtful cases where the question of operation arises that the radiologist will be called upon to decide on its conditions.

ROYAL SANITARY INSTITUTE.

CONGRESS AT MARGATE, JUNE 21ST–28TH, 1930.

(*Continued from p. 43.*)

LAST week some account was given of an important discussion in the Section of Preventive Medicine. A report follows of two other topics which were warmly debated. To emphasise the catholicity of the gathering, the Council of the Institute entertained the overseas delegates to luncheon, at which Surgeon DANA E. ROBINSON (Washington), Dr. W. J. BELL (Ontario), and Dr. HARRY B. BURNS (Pittsburg) responded to an address of welcome by Sir GEORGE NEWMAN.

Maternal Mortality.

In the Section of Maternity and Child Welfare, Dame LOUISE MCILROY stated her conviction that criminal abortion was on the increase and was an important factor in keeping up maternal mortality and morbidity. She thought the increase was chiefly amongst married women.

A councillor from a northern industrial town, who described himself as an unregistered practitioner, was certain from the nature of the applications made to him that this increase was a fact and affected both the married and unmarried. He knew, the police knew, and it was common knowledge, where these illegal operations were carried out. He suggested that police raids might do some good. After the school age had been raised he thought more education should be given in sex matters.

Another councillor, a retail chemist in London, said that he sold appliances such as gum-elastic catheters, which he felt certain were to be used for this purpose. He was convinced that Prof. McIlroy had understated the evil and he went on to refer to the huge sale of pills, obviously for use as abortifacients, by reputable drug firms. He would like to see the Pharmacists Union and the medical authorities combine to put a stop to the sale of these drugs. It was the unqualified chemist who was the stumbling block.

Prof. McIlroy said the police would be unable to get evidence to justify their raids and suggested that the pharmacists should themselves take steps to get rid of unqualified competitors as the doctors had done. They must look to the law to find the means of stopping the sale of these drugs and appliances. In the meantime the remedies which she suggested were a better moral outlook and a realisation by the public of the dangers of abortion and its effect upon mortality and health. Confidential notification of all abortions might give some idea of the prevalence of the practice.

Alderman HEPPENSTALL (chairman of the Twickenham Health Committee) said it was impossible for the police to get evidence upon which they could act. Drugs which were harmless or useful in small doses could not be ruled out. Only propaganda was left.

Birth control was advocated by one speaker as a preventive and Dr. STELLA CHURCHILL remarked that the expectant mother living with her family of seven in one room (mentioned by a previous speaker) was a fit object for therapeutic abortion.

SCOPE OF PREVENTION IN OBSTETRICS.

Dr. C. S. LANE-ROBERTS gave a lucid description of the aims of preventive midwifery, and Dr. LEONARD COLEBROOK a frank exposition of the gaps in our knowledge of the bacterial causes of puerperal fever. He showed a model of the new unit at Hammersmith of Queen Charlotte's Hospital, shortly to be opened, with its wards for 30 patients with puerperal infections and research laboratories fitted to accommodate several research workers, and made an appeal for other similar enterprises. We had, he said, the men for the research but not the money. He showed how our present knowledge might be applied to greater advantage.

Dr. S. G. MOORE suggested that while this bacteriological research work was in progress other local authorities would find it useful to adopt the Huddersfield scheme. Voluntary notification of pregnancy was there followed by a visit to the home and supervision by a woman doctor. Expectant mothers using these facilities had increased in number from 11 to 50 per cent. and the mortality among them had been reduced to one-third.

Hygiene on Ship-board.

At a conference of Port Sanitary Authorities, Lieut.-Commander H. J. CAVILL, of the Shipping Federation, Ltd., gave a description of the accommodation for the health and comfort of seamen which might be provided for the crews in merchant ships in spite of limitations of space. His assurance that shipowners as a whole were keenly alive to the improvement of crews' quarters aroused dissent.

Dr. J. HOWARD-JONES (M.O.H., Newport) said we were far behind many continental countries. A few British owners insisted on proper accommodation being made for the crews by the naval architects; most were content with the expression of pious opinions. The accommodation provided was uncomfortable and often wasteful of space. The Royal Sanitary Institute, the Society of Medical Officers of Health, and the Association of Port Sanitary Authorities had appointed a standing committee to press for reform but so far the Board of Trade had remained content to let compulsion wait on persuasion.

Dr. F. MCCALLUM (Chief M.O., Commonwealth of Australia) stated that their medical officers saw the plan of every ship before it was laid down. They always insisted on good washing and other accommodation; he believed their requirements were in advance of the rest of the world.

Dr. W. F. DEARDEN described Manchester as a typical port for medium-sized ships. He had kept records for two ten-year periods. During the first, British ships were in a good position, but during the second decade many foreign-built ships were far ahead of the British, and during the last two or three years some of the new British ships were worse than they were in the second decade. The British Government had no power to prescribe a standard. The Scandinavian standard, which was very high, was only reached by some British ships.

Dr. C. F. WHITE (M.O.H., Port of London) explained that Commander Cavill could not reply to criticisms as he was a member of the Committee of the Shipping Federation, which had this matter under consideration. He felt sure his hearers would be well satisfied when they read the recommendations in the report about to be issued.

Dr. L. W. HARRISON described a course of treatment for venereal diseases, which he had devised to suit the special circumstances of seamen, with a minimum of interference with their occupation. The course would be administered partly by the 300 V.D. clinics established in ports throughout the world under the Belgian Agreement and partly by the ships' surgeons. This scheme was now under the consideration of the expert Committee of the League of Nations.

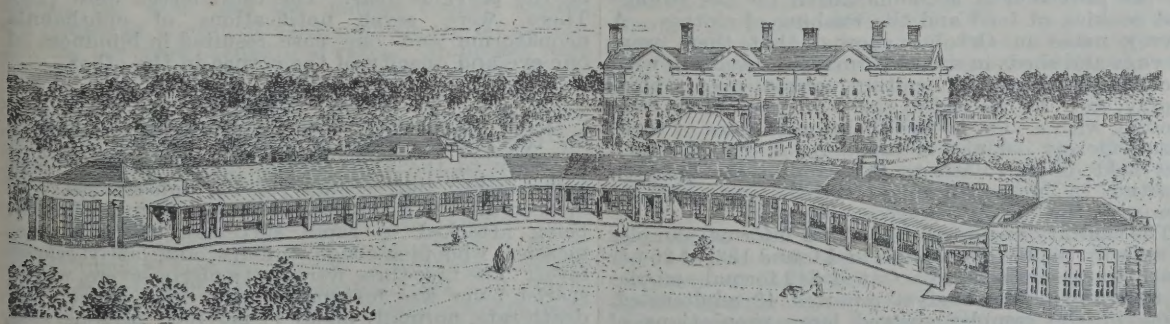
DERATISATION.

Dr. E. R. PEIRCE (Assistant Port M.O., Liverpool) dealt with article 28 of the International Sanitary Convention requiring the deratisation of ships. He described the elaborate method adopted in Liverpool for estimating the rat population in ships by counting the rat droppings during 24 hours after the ship had been swept. Due regard had to be paid to the diet of the rats. Dr. Peirce gave examples to show that a high degree of accuracy was obtainable; there was, he said, very close correspondence between the estimates made and the number of dead rats found after fumigation. He claimed that this system had added a new interest to work which was apt to be monotonous and that the estimations were keenly watched and a healthy rivalry established among the men. In reply to a question, Dr. Peirce stated that no standard had been laid down as to the number of rats on a ship which justified the expense of deratisation. They found it safer in most cases to fumigate than to give a certificate of exemption.

A MODERNISED NURSING HOME.

THE Haslam Nursing Home at Bolton, the opening of which was mentioned in a recent issue of this journal, is intended to supply accommodation for persons of small and moderate means as well as for the more well-to-do class of patient. It was at first proposed to build in the grounds of the existing infirmary, but on further consideration it was decided to add to Newlands, a house which had formerly belonged to the late Mr. J. P. Lord. The old building has been converted into the administrative department and nurses' home, and is connected with the patients' quarters by a block of buildings containing the kitchens and staff dining-rooms. The patients' quarters lie round three sides of a hexagon, open towards the southern aspect, and forming a long one-storey building from which 22 single rooms and two four-bed wards open on to a glass-roofed veranda. Bathrooms are attached to each wing and to one or two of the single bedrooms. The operating theatre and X ray installation lie behind the patients' quarters, and detached from the main building except for a connecting corridor. The home stands in about six and a half acres of wooded grounds sloping to the south, with a wide stretch of turf before the veranda. Furniture, paint, and equipment are all of the most recent type, and designed to save labour; central heating has been installed. Fees will vary from 4 guineas a week in the wards to 7 or more guineas, up to 12 in the private rooms; patients will be attended by their own medical men while in residence. The home, which is the gift of the Haslams and the Scotts, two Bolton families, is likely to prove valuable to many of those patients who do not fall into the hospital class, but whose means are insufficient to meet high fees.

HASLAM NURSING HOME.



Showing addition in the form of a one-storey pavilion.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of three county boroughs, a united county district, and three boroughs.

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Nottingham .. (266,800)	17·0	15·3	1·26	1·52	3·6	3·2	97/—	47	3·3
Northampton (93,970)	13·3	11·6*	0·82	1·57	1·9	2·6	53/30	38	3·2
West Bromwich .. (80,840)	20·7	14·9	0·88	1·07	4·5	1·9	106/36	90	4·7
East Kent United D... (48,480)	11·3	12·6	0·82	1·51	2·1	2·6	70/—	—	1·7
Gillingham .. (55,050)	15·6	12·5	0·83	1·45	1·9	2·7	57/29	—	4·0
Colchester .. (44,890)	14·4	12·9	0·91	1·51	1·9	2·9	26/—	29	1·4
Stafford .. (28,680)	15·5	11·6†	0·91	1·36	2·0	2·4	63/29	29	4·5

* Standardised 10·7. † Standardised 11·5.

Registered stillbirths per 100 live births: Nottingham 4·7, Northampton 3·8, West Bromwich 2·9, Gillingham 4·3, Colchester 3·6, Stafford 5·4.

Nottingham.

Dr. Cyril Banks, who was appointed in January, 1929, submits a short report in view of the comprehensive report for the years 1916–28 submitted by the late Dr. Boobbyer, and the fact that 1930 is the year for a survey report. Nottingham suffered severely from the influenza epidemic. The death-rate from respiratory disorders showed a large increase. The general death-rate was 2·0 higher than the average for the previous five years. For a similar reason infant mortality went up from 85 to 96, and the tuberculosis death-rate was also increased. Changes have been made in the staff. A new chief sanitary inspector has been appointed and the city has been divided into seven districts for sanitary and housing inspection. It is hoped to deal, at an early date, with the unhealthy districts scheduled by the late medical officer. The industrial smoke problem will also receive more attention. The course of lectures for stokers delivered early in 1930 at University College was well attended. Steps are being taken to improve the "farmed out" houses by the provision of accommodation for the storage and cooking of food and the washing of clothes. A survey made in October showed that there were 93 vans and sheds in use as permanent dwellings with a complete absence of sanitary conveniences, water-supply, &c. At the end of the year proceedings were pending with a view to the abolition of some of these unsatisfactory colonies of vans. A national rat week was held on Nov. 4th to 9th, and it is hoped to institute a more thorough continuous anti-rat campaign throughout the year.

The sanitary inspectors tested 732 informal samples of milk by the Gerber process and found 183, or 25 per cent., to be adulterated. Out of 342 formal samples of milk the public analyst reported 43 adulterated. Some of the samples showed large proportions of added water and others high percentages of fat-deficiency. Proceedings were taken in respect of 15 samples. Three cases were dismissed, and in the remainder comparatively small fines were inflicted. During 1929 the average duration of stay in hospital for scarlet fever was 35·4 days, the figure being kept high by a few cases, which remained in for a very long time. The average stay in 1919 was 73·7 days, and in 1928 it had fallen to 43·6. Scarlet fever has been mild during recent years, and the use of the anti-toxin has further helped to shorten the stay in hospital. The venereal diseases clinic has been greatly improved during the year.

Northampton.

Dr. Stephen Rowland reports that the chief event was the presence of small-pox during the whole year. There were 479 notified cases, but many cases were concealed, and there was much opposition to the vaccination of contacts. The only death was that of a female, aged 59, vaccinated in infancy, and with four visible marks. She was admitted to hospital in a debilitated condition having suffered for years from large foul-smelling ulcers on both legs, and her case was complicated by acute laryngitis. The bacteriological examination of the town's water-supply shows considerable variation from time to time without apparent cause. Sometimes, when coliform organs were found in 5 c.cm., the total bacterial count was quite low. A small outbreak of enteric fever was considered to be due to the contamination of "Jubilee well," Kingsthorpe. Eight genuine cases from four houses which all used the well water occurred, but none of them was severe. The bacteriologist's report was unconvincing and the water appeared to be as pure as the town's supply. It was considered that the well water might have been infected during some drainage operations in the neighbourhood.

No slum clearance on a large scale was started during the year, but when, in the near future, the old destructor is demolished, a large area will be available for the erection of a small type of house similar to some municipal houses already built. Many families, says Dr. Rowland, cannot pay the rent for the expensive semi-detached houses on the outskirts of the town, together with travelling expenses to and from their work. He instances the case of a labourer earning 45*s.* per week, with a large family, and ordered to abate the overcrowding. This man was offered a corporation house at 15*s.* per week, but no philanthropist was forthcoming to act as guarantor.

Dr. Rowland has a good deal to say about the exaggerated claims made for artificial sunlight treatment. Of 18 cases of non-pulmonary tuberculosis treated at the General Hospital 14 were reported to be improved, and Dr. Evelyn F. Bevington claims that the children suffering from rickets, debility, &c., and treated with artificial light at one of the centres showed marked improvement. Two antenatal clinics are in operation, one being held at the Queen's Institute of District Nursing. The new cases attending these clinics numbered 585, a considerable increase on the previous year. The total births were 1249. There were seven notifications of ophthalmia neonatorum and one case resulted in blindness of one eye and opacity of the cornea in the other.

West Bromwich.

Dr. W. Stott says 1929 will be marked in history for two totally different reasons. Firstly, as preparatory to the vast changes to be made in local government; and, secondly, as the unhealthiest year on record. The town was never free from epidemics, being attacked in rapid succession by influenza, measles, whooping-cough, mumps, and lastly scarlet fever. The first three were particularly severe, whilst scarlet fever was fortunately of a mild type. The death-rate, normally about 11 per 1000 persons, rose rapidly in the first quarter to 46·2 in the beginning of March. Measles and whooping-cough have been

made notifiable. Dr. Stott hopes that the committee will admit severe cases of these diseases to the Fever Hospital. The infant mortality-rate "again passed the 100 mark" owing to the almost simultaneous outbreaks of influenza, measles, and whooping-cough, and the very high death-rate among young children was due to the same cause.

Systematic house to house inspections have been carried out, including 1991 houses, which were inspected six to nine years previously, so that a comparison with present-day findings is interesting. The population in the 1991 houses has fallen from 9432 to 8898, the number of multiple occupancies from 298 to 254, and the number of instances of overcrowding from 133 to 118. It therefore looks, says Dr. Stott, as if matters were slowly improving. Another interesting comparison is given of the conditions found in 86 privately erected subsidy houses, nearly all owner-occupied, and 32 houses belonging to the corporation. The population of the 86 privately owned was 294, or 3·6 persons per house; in only three was there more than one family, and only one house was overcrowded. In the 32 corporation houses there were 239 persons, or 7·5 per house; there were 12 cases of multiple tenancy and 5 cases of overcrowding. The corporation by their by-laws prohibit subletting, but do not attempt to stop it. Anyone, whether clean or dirty, may become a subtenant, and in some cases the subtenants pay the total rental. The corporation houses "are gradually becoming new slums." Dr. Stott's remedy is that the corporation should allow subletting on conditions. Every subtenant should be approved; there should be no subletting to produce overcrowding; the rent of the subtenant should be fixed by the committee, and when subletting is permitted the total rental should be made an economical one.

A scheme has come into operation by which the midwives are paid 1*s.* for a report on the character of the labour of all cases attending the antenatal clinics. The new cases attending the five antenatal clinics number 261, the total births being 1682. Only a few of the midwives as yet send their cases to the clinics.

East Kent.

The united district extends about 20 miles along the north coast of Kent from the North Foreland to Whitstable, and is bounded on the south by the River Stour and the city of Canterbury. It includes the whole of the Isle of Thanet, with the exception of the boroughs of Ramsgate and Margate. It consists of the two urban districts of Broadstairs and St. Peter's, and Herne Bay and the two rural districts of Thanet and Blean. Dr. A. M. Watts shows that during 1929 the deaths exceeded the births in the district as a whole, but were lower than the births in the two rural districts. The summer population of the two urban districts is about doubled by visitors, who also patronise the rural districts. In the two rural districts agriculture is the main occupation, but in Blean there is a colliery (Chislet) employing 1000 men, and the Manston aerodrome is situated in Thanet, with 80 officers and 1200 men. In Blean rural district 100 houses were completed by the colliery during the year, and the district council erected 12 houses at a cost of £4624, which are let at 11*s.* and 9*s.* per week exclusive of rates. No houses were erected in Broadstairs urban district, but Dr. Watts has advised the council to build, as there are several houses needing demolition, and at the end of the year the council advertised for applications from persons who desired municipal houses. Referring to the high rentals in this district, Dr. Watts points out that if working people have to pay 25 to 50 per cent. of their income in rent and rates, they have to go short of necessaries, and to be assisted out of public funds in case of sickness. Thanet rural district includes two parishes, Westgate-on-Sea and Birchington, which are governed by parish councils reinforced by the rural district councillors of the parish. Sixty houses were built in Thanet during the year, 14 being in Westgate and 28 in Birchington. Only about 18, however, are suitable for the working classes. Five applications were received in Thanet under the Housing (Rural Workers) Act, and grants were allowed for four of them.

Diphtheria was more prevalent than in the previous year. There was an outbreak in connexion with a school in the Blean district. The exclusion of children by swabbing and the measures of disinfection carried out appeared to be effective. Private schools, institutions, and convalescent homes in this district are responsible for a large proportion of the cases of infectious disease notified. Efforts are being made to induce these institutions to provide temporary isolation accommodation, and in two instances in Broadstairs this provision was made. The isolation hospital accommodation for the Isle of Thanet is inadequate, and will no doubt come under the purview of the county council under the new Local Government Act.

Gillingham.

Dr. W. A. Muir reports that more commodious office accommodation has facilitated the work of the department. Two new child welfare centres have been opened in the borough, and it is hoped to give increasing attention to the pre-school child. There were two notifications of small-pox in April. One was of the mild type and the other, a passenger from s.s. *Tuscania*, died from hæmorrhagic small-pox. Rooms are sprayed with formalin after the removal or death of cases of pulmonary tuberculosis and enteric fever, but in the case of scarlet fever and diphtheria thorough cleansing is relied upon. Of the eight notified cases of ophthalmia neonatorum there was one case of serious impairment of vision and possibly total blindness, notwithstanding prompt hospital treatment. The council erected 133 houses during 1929. The rentals, including rates, ranged from 13*s.* 4*d.* to 11*s.* 2*d.* per week. Although the unskilled labourer cannot pay these rents, Dr. Muir considers that he benefits by "moving up" to a better vacant house.

Colchester.

Dr. W. F. Corfield thinks the infant mortality-rate of 26 is probably the lowest ever recorded for a town the size of Colchester. The total deaths showed an increase of 73 on those of the previous year, the increase in heart disease being 53. Many of the latter were accelerated by the influenza epidemic. There were 15 deaths of residents and non-residents from motor accidents in the borough during 1929. The appointment of a full-time dentist has enabled a weekly clinic to be established for expectant mothers and young children. The subsidised new houses numbered 147, and the housing shortage is being overtaken. There are a number of worn-out houses which ought to be closed. The landlords say they are not worth spending money on, and are being asked to accept tenants without children as a makeshift for the housing of elderly people until houses at an all-in rate of from 4*s.* to 8*s.* a week are available. For three years the prevalence of diphtheria has been very low, 7, 8, and 10 cases, but in 1929 there were 47. Dr. Corfield discusses the unaccountable behaviour of this disease. Scarlet fever cases are discharged during the fifth week, if free from complications. Of the six "return" cases which occurred two were the brother and mother of a child who had been in hospital for 143 days.

Stafford.

Dr. J. T. Macnab reports that the influenza epidemic in his borough was followed by whooping-cough and by measles in the latter half of the year. Further housing schemes are to be undertaken, and it is hoped that overcrowding and the closure of the worst houses will then receive attention. The reservation of 40 municipal houses for families nominated by the Health Department has done much to relieve serious overcrowding in unhealthy surroundings. No less than 160 children, 70 of whom were under

5 years of age, were thus removed from very unsatisfactory conditions to a good environment on the new estate adjoining the common. There are about 80 houses needing demolition and 20 more families living overcrowded. In most of these 100 cases the rentals are about 5*s*. Mechanical filtration is being installed for the swimming bath and should be in operation during 1930. The inspectors are experiencing much difficulty in tracing the pollution of water courses by oily substances. Stafford has adopted the model by-law for smoke abatement on the recommendation of the Midlands Joint Advisory Council, but it is expected that there will be difficulty with the salt works, where one of the chimneys serves 12 furnaces. There are two modern slaughter-houses and 13 old ones in quite unsuitable surroundings. The needs of the town would be well met if there were a third modern establishment to do the work of the 13 older ones.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 28TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 182 (last week 241); scarlet fever, 1630; diphtheria, 1114; enteric fever, 86; pneumonia, 605; puerperal fever, 39; puerperal pyrexia, 88; cerebro-spinal fever, 14; acute poliomyelitis, 5; acute polio-encephalitis, 2; encephalitis lethargica, 14; continued fever, 1; dysentery, 5; ophthalmia neonatorum, 93. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 1st–2nd was as follows:—Small-pox, 354 under treatment, 6 under observation (last week 399 and 9 respectively); scarlet fever, 1834; diphtheria, 2019; enteric fever, 23; measles, 448; whooping-cough, 76; puerperal fever, 22 (plus 13 babies); encephalitis lethargica, 122; "other diseases," 16. At St. Margaret's Hospital there were 10 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 17 (3) from measles, 4 (2) from scarlet fever, 12 (1) from whooping-cough, 26 (5) from diphtheria, 43 (9) from diarrhœa and enteritis under two years, and 10 (1) from influenza. The figures in parentheses are those for London itself.

No great town had more than 2 deaths from measles; Liverpool and Stockton-on-Tees reported 2 each. Two fatal cases of diphtheria were reported from each of West Ham, Bristol, Birmingham, Coventry, and Liverpool. Diarrhœa was responsible for 4 deaths at Portsmouth and 3 at Manchester.

The late returns for the month of May include 2 deaths from small-pox assigned to Newark M.B. (Notts), and Bedwellty, U.D. (Mon.). In addition, a death belonging to Stoke-on-Trent C.B. occurred outside that area during the week ended May 3rd.

The number of stillbirths notified during the week was 323 (corresponding to a rate of 45 per 1000 births), including 37 in London.

CORRESPONDENCE

CHOLELITHIASIS AFTER BLACKWATER FEVER.

To the Editor of THE LANCET.

SIR,—All students of tropical medicine will be interested in reading Dr. Keith Fairley's paper in your issue of June 28th. The case he quotes is apparently the first in which actual proof was obtained of the formation of pigmented biliary calculi as the direct sequel of inspissation of bile and the result of the hæmolysis of blackwater fever. It aroused my attention because I have recently met with an instance of recurrent biliary colic in one of my patients recovering from a severe attack of blackwater fever. This patient, an assistant in a business house, was employed in the Cameroons, and was seen by me for an attack of malaria on Oct. 12th, 1929, and was ordered to take grs. 10 quinine hydrochloride daily. On the evening of Nov. 9th, 1929, he suddenly developed an acute attack of blackwater, and on the next day was admitted to the Hospital for Tropical Diseases. Treatment consisted of a preliminary intravenous injection of 1 pint of sodium bicarbonate (grs. 150 to the pint), followed the next day by a blood transfusion of 350 c.cm. He made a very rapid recovery so that within four days the jaundice had cleared away. On Nov. 30th, three weeks after the advent of blackwater, he had a series of typical attacks of biliary colic each lasting ten minutes, and requiring injections of morphia for their alleviation. Ten days later there were further attacks accompanied this time by obstructive jaundice. Still more attacks were noted in December and early in January, 1930, when they became less frequent and less severe till they finally passed away. It was assumed that he had passed biliary sand in each of the attacks, and that they were due to inspissated bile-pigment in the gall-bladder. In this case no direct assistance in the diagnosis of cholelithiasis was obtained by the tetra-iodo-phenolphthalein dye test, or by attempts to visualise the gall-bladder by means of X rays.

I am, Sir, yours faithfully,

PHILIP MANSON-BAHR.

Weymouth-street, W., July 2nd, 1930.

METABOLISM IN BLACKWATER FEVER.

To the Editor of THE LANCET.

SIR,—I have read with deep interest Dr. Donald Hunter's Goulstonian Lecture on the Significance to Clinical Medicine of Studies in Calcium and Phosphorus Metabolism in your issue of April 26th, and it is with great diffidence that I offer a suggestion, based on the above paper, on the pathology of blackwater fever. My excuse is that any avenue of approach which might help to throw light on this malign manifestation is deserving of consideration.

Has any worker hitherto investigated the question of phosphorus metabolism and the influence of phosphatase in this connexion? It is well known that certain organs are not infrequently attacked by the malaria organism—e.g., an involvement of the intestine results in abdominal signs, that of the brain in cerebral malaria. The subjects of blackwater are usually under-nourished. During the war I had occasion to attend over 90 cases of blackwater which occurred among the Indian troops who at the time were so situated that no fresh food, meat, milk, eggs, or vegetables were available. The diet consisted of rice, ghee, wheat flour, and lentils. In other words, the rations lacked in great measure phosphorus. May it not be that in a certain proportion of malaria cases the parathyroid gland becomes involved and stimulated to increased activity, which would result, presumably, in a lowering of the phosphorus threshold,

and thus, in the circumstances described, render the phosphoric esters of the red blood corpuscles unstable and easily prone to disintegration by the combined action of phosphatase and the demands of the hæmamœba for nutriment? The concentration of phosphatase in quantity in the cortex of the kidney might explain the mechanism of suppression.

This view may account for the beneficial results claimed in the treatment of blackwater fever, with intravenous injection of sodium acid phosphate, its irregular geographical distribution, and the reason why some suffer while others do not. It would be interesting if Dr. Hunter were kind enough to find time to criticise this speculative theory.

I am, Sir, yours faithfully,

J. O. SHIRCORE,
Director of Medical and Sanitary Services,
June 11th, 1930. Tanganyika Territory.

STRAMONIUM IN THE TREATMENT OF MUSCULAR RIGIDITY.

To the Editor of THE LANCET.

SIR,—As no comment has been made in your correspondence columns on the dose of stramonium recommended by Dr. C. Worster-Drought and Dr. T. R. Hill in their most interesting and valuable paper (June 7th, p. 1225), I feel it is desirable that a note of caution should be sounded. A dose one-third the size of that recommended is liable to cause unpleasant symptoms in not a few patients when given for asthma, and I have found that 15 to 20 minims thrice daily is a maximal dose for general use. Personally I have not used stramonium for the muscular rigidity of parkinsonism, but for 30 years I have freely used the less active tincture of hyoscyamus for the similar type of rigidity which is the cause of tonic hardening of the colon; or, as it is now sometimes called (and I believe incorrectly), "spastic" colon. This drug in 20-minim doses when combined with an intestinal antiseptic is most potent in controlling the abnormal muscular activity and in arresting the mental depression, obsessions, or other symptoms which may characterise this ailment. Tincture of hyoscyamus, in 20-minim doses given thrice daily, is, however, sufficient to do this and, not infrequently, even this dose causes dryness of the throat or other unpleasant symptoms. I feel sure that to give three times daily 60 minims of the more potent tincture of stramonium would not be wise as a general rule.

I am, Sir, yours faithfully,

Birmingham, July 1st, 1930. T. STACEY WILSON.

THE REMOVAL OF NON-MALIGNANT TUMOURS OF THE BREAST.

To the Editor of THE LANCET.

SIR,—The learned, practical paper on this subject by Mr. Greenwood, published in your issue of July 5th, gives me the opportunity of making myself clear upon the question of so-called "chronic mastitis." Two separate conditions are confused within this single term. Neither of the two conditions would be accurately described by the application of this term.

The first state is that in which the terminal ducts and acini are surrounded by hyperplasia of the peri-canalicular and periacinous connective tissue, amongst which lymphocytes and macrophages may be present. There is often a desquamative epithelial hyperplasia of a very definite type in the affected ducts and acini. It is a very common and almost universal state in all breasts of women who have borne children. It also appears, but less commonly, in virgins. The same morphological appearances are seen normally in the breasts of male and female children at birth, in girls at puberty, and in breasts of pregnant women, and during lactation. It is almost a physiological condition and ceases to give rise to symptoms at the menopause. Cysts are not formed as a part or sequence of this state. The only lesion that can be directly traced to this state is the formation of a certain type of fibro-adenoma. This condition is so universal that the oxygen we breathe is just as impossible a factor to trace as an actual or predisposing cause of disease. Mazoplasia is the term I would apply to this condition.

The second condition, and a much more important one, that is included in the term "chronic mastitis" is the lesion best known as "Schimmelbusch's disease" or "maladie reclus." It also affects terminal ducts and acini, and in its earliest stage a specific type of desquamative epithelial hyperplasia occurs that cannot be mistaken for anything else, and forms the common cysts of the breast. The epithelial hyperplasia may pass into a state of epithelial neoplasia, at first benign, which may become carcinomatous, and does so in at least 20 per cent. of all carcinomata of the breast.

I would venture to suggest the advisability of dropping the term "chronic mastitis" altogether. It would make the path of the student more free from obstruction if the first state were called "mazoplasia," and the second "Schimmelbusch's disease."

In the *Cancer Review* of February, 1930, the two states are described in detail, and I respectfully advise all who are interested in this matter to read the article I wrote therein upon Precancerous Conditions of the Breast.

I am, Sir, yours faithfully,

G. LENTHAL CHEATLE.
Harley-street, W., July 4th, 1930.

NOISE IN HARLEY STREET

To the Editor of THE LANCET.

SIR,—I am glad to see that Sir Thomas Horder and others have taken up the question of the devastating din that is being produced in the building of the London Clinic. I have the misfortune to live within 100 yards of this appalling row; and it has meant during all this hot weather that conversation, telephoning, or the use of the stethoscope have been quite hopeless without closely shutting up all the windows. Even then the irritation is nothing short of intense.

The one redeeming point about it is that it has brought home to me—much more forcibly than politely—the effect of noise on the nervous system. It is almost unbelievable; people who are otherwise placid and unruffled become irritable and tired. The strain of this din going on all day long acts as a powerful irritant to the nervous system. If any medical man would care for proof of this he is quite welcome to half an hour in my consulting room with a stethoscope, or even to try a call or two on the telephone, with the windows open.

By day Marylebone-road is one of the noisiest in London; by night, owing to the heavy type of traffic that passes through, I should say it is, without doubt, *the* noisiest street in London. But why we should be tortured by this extra and avoidable infliction without registering a pretty vigorous protest I do not know. Unless something is done pretty

quickly to mitigate this serious nuisance, I fear the sympathetic support mentioned by Sir Thomas Horder will be gravely imperilled in a good many cases. I am, Sir, yours faithfully,

A. GRAHAM-STEWART.

Ulster-place, Upper Harley-street, N.W.,
July 4th, 1930.

THE RAPID CURE OF SCHISTOSOMIASIS.

To the Editor of THE LANCET.

SIR,—Late vomiting and gastric disturbance were so pronounced in two cases of bilharzia disease treated as out-patients at Durban in January last with neo-antimosan or fouadin, that the drug was discontinued in one of the patients after the third dose. The other patient was able to stand a total of 53·5 c.cm. in 31 days, but was continually complaining of indigestion and late vomiting, and showed a badly furred tongue throughout. Unfortunately, the normal ovum of *Schistosomum hæmatobium* was present in the urine three months later and the urine was frequently bloodstained. A colleague was therefore requested to test fouadin in the treatment of some native bilharzia patients he had as in-patients, and he did not observe any such toxic effects from the doses that are recommended.

The box containing the ampoules of fouadin with which the toxic symptoms were associated, was returned to Messrs. Bayer Ltd., who reported that no change had occurred in the chemical nature of the contents, and that the toxicity coincided with that of the standard preparation. The question arises whether the destruction of these large blood parasites by a drug which causes their too sudden death may not be responsible for the formation of septic foci in the liver substance or other site away from the mesenteric veins which would seem to be a favourite site for the living bilharzia worms.

I am, Sir, yours faithfully,

F. G. CAWSTON, M.D. Cantab.

Durban, Natal, June 17th, 1930.

RETROBULBAR NEURITIS AND DISSEMINATED SCLEROSIS.

To the Editor of THE LANCET.

SIR,—May I add the following case to those recorded by Dr. C. P. Symonds in your last issue, emphasising the necessity for regarding all cases of retrobulbar neuritis, in which no ætiology is found, as potential cases of disseminated sclerosis? In his series the longest interval between the ocular symptoms and the development of other signs appears to be sixteen years. In the following case *twenty-two* years elapsed before further symptoms of disseminated sclerosis developed.

Mrs. X., aged 43 years, was referred to me by Dr. T. St. John Barry, of Wallasey. When 18 years old she suddenly lost the sight of the left eye, and before this had completely recovered she lost the sight of the other; both eyes recovered completely in a few months. She thinks she experienced transient numbness of the right leg at this time. No further neurological symptoms developed until three years ago, when she noticed weakness in the lower limbs, and unsteadiness of gait. Two years ago she lost anal and vaginal sensation for a month, since when she has had precipitance of micturition and occasional incontinence of urine. On examination her optic discs show definite temporal pallor; she has slight lateral nystagmus, a spastic paraplegia, absent abdominal reflexes, and diminished vibration and joint sense in the lower limbs—a typical clinical picture of disseminated sclerosis.

But the initial symptoms in disseminated sclerosis, other than ocular, may precede the more marked development of the disease by an equally long period. Thus, in one of my cases, a "useless right arm" developed in 1903, associated with numbness of the left leg, and no further symptoms appeared for 25 years. All such cases provide interesting comment on the difficulty of assessing the value of so-called specific treatments in this disease.

I am, Sir, yours faithfully,

Liverpool, July 5th, 1930. HENRY COHEN.

OBITUARY

GEORGE NEIL STEWART, M.D. Edin., D.P.H.,

PROFESSOR OF EXPERIMENTAL MEDICINE IN THE WESTERN RESERVE UNIVERSITY, CLEVELAND.

WE regret to record the death of Prof. George Stewart, the well-known physiologist and worker in experimental medicine, which occurred on May 28th last in Cleveland. He had been suffering for some time from a condition which had been diagnosed as pernicious anæmia.

George Neil Stewart was born in London, Ontario, where his father, James Innes Stewart, resided, and where he received his preliminary education. He entered the University of Edinburgh, and having graduated with mathematical honours joined the medical school. He was a highly distinguished student, being Neil Arnott scholar and prizeman, Mackay-Smith scholar in physiology, and Bell and Goodsir prizeman in the same subject. In 1889 he became D.Sc., and two years later graduated in medicine with the gold medal. Thereafter he did post-graduate work in Berlin, Strassburg, Aberdeen, and Cambridge, being George Henry Lewes student at the last-named University, where he also obtained the diploma of D.P.H. In 1894 he was elected professor of physiology in the Western Reserve University, Cleveland, a post which he held for nine years, when he accepted the post of professor and director of the physiological laboratories of the University of Chicago. This post he held till 1907, when he returned to the Western Reserve University as professor of experimental medicine and director of the H. K. Cushing laboratory, posts which he held at the time of his death.

From this summary it may be gathered how wide and practical Prof. Stewart's labours in his specialty were, a fact which was reflected both in his manual of physiology, the eighth edition of which was published 12 years ago, and in his contributions to the *Journal of Experimental Medicine*, the *Journal of Pharmacology and Experimental Therapeutics*, and various contributions to the Proceedings of the Royal Society of Edinburgh and other learned bodies. He was, indeed, one of the most prominent exponents of experimental pathology in the United States, and his death leaves a gap in the ranks of research workers.

Prof. Stewart's end was sadly sudden. On the morning of May 28th he was found in a state of coma in his apartments, and efforts to make a blood transfusion failed, for he died before a donor of the proper type could be secured. He leaves a wife and four children who are resident in Toronto, where his ashes were taken for burial after cremation.

JOHN JEROME SUCKLING, M.B.Lond.

Dr. J. J. Suckling, who died at his home in Margate on June 24th, was the son of Dr. C. W. Suckling, consulting physician to Queen's Hospital, Birmingham. Educated at University College Hospital, London, he qualified in 1908, and held house appointments at his hospital before settling in practice at Margate, where he was successively in partnership with Dr. Scales and Dr. Gosset. "By his early death," writes a colleague, "Margate has sustained a serious loss, for Suckling was one of the best type of family doctor—reliable, courteous, and conscientious. He had a fine all-round knowledge of general practice, and in midwifery he excelled owing to the care he took to see that all was right before, during, and after confinement. Though never blessed with robust health nothing ever seemed a trouble to him, and to the younger men his was always the helping hand; for he had a shrewd knowledge of humanity and his advice was always sound and to be trusted." Death was due to an acute lobar pneumonia. Dr. Suckling leaves a widow.

PROF. MATTHES.

Dr. Max Matthes, who died at Meran on March 26th, was professor of internal medicine at the University of Königsberg and well known for his "Lehrbuch der Differential-diagnose Innerer Krankheiten" which ran through six large editions and was translated into English, Spanish, Russian, and Czechoslovakian. His junior colleague, Dr. Rudolf Wigand, has sent us an appreciation of his life and work.

"Matthes," he writes, "was a man of untiring activity, always willing and ready to study, to learn, to help, and to discover something new. His understanding of human nature earned him the reputation of being one of the foremost diagnosticians of his time. As a scientist he was always an enemy of superficiality and a diligent searcher for the truth, never impatient or harsh with others, but unsparing of himself. He first began to attract attention through his observations on the effect of albumoses on the tuberculous and non-tuberculous organism. This was soon followed by his work with L. Krehl on fever. His reputation was enhanced by his leaning towards chemistry and physiology, and to this day his work on ulcer of the stomach done in 1897 remains fundamental."

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

THE SLUM CLEARANCE BILL.

ON Tuesday, July 1st, Standing Committee A of the House of Commons completed the consideration of the Housing (No. 2) Bill after a sitting of seven hours.

WHO IS TO MAKE THE REPRESENTATIONS?

On Clause 44 (provisions with respect to official representations),

Sir P. PILDITCH moved two amendments with the object of maintaining the law as it stands in regard to official representations made to local authorities. He said under the present law in the Act of 1925, whilst in all important matters such as clearances, big and important schemes and the like, the representation must be made by the medical officer of health in regard to smaller matters such as those dealing with the repair or closing of individual houses, it was open to a local authority to listen to the representations of other officers besides the medical officer of health. If the Bill passed as it stood the only person entitled to make official representations would be the medical officer of health. He agreed that in all important cases the medical officer was the proper person to make representations, but he did not think any case had been made out why in regard to all those small matters connected with separate houses and the like, the official representations should not be made by any other official of the authority, including the sanitary inspector. There was nothing in his amendments which proposed to alter the status of the medical officer of health as compared with that of the sanitary inspector. There was no desire to change the decision made in 1926 that the medical officer of health should be the superior officer in all cases.

MEDICAL OFFICER OR SANITARY INSPECTOR.

Mr. WOMERSLEY, who with Mr. BLINDELL had two amendments on the clause seeking the same object as the amendments moved by Sir P. Pilditch, said that he was putting his amendments forward on behalf of the Sanitary Officers' Association. As a member of a housing committee of a local authority he said he thought the sanitary inspector ought at any rate to be allowed to maintain his present status. He did not, however, suggest that the sanitary inspector should be given a greater status or a greater power to act over the head of the medical officer of health for the district. He looked on the medical officer of health as the superior officer, but at the same time he was satisfied from his own experience that it would be wise to allow the sanitary inspector to report direct to the health committee. He was satisfied that these men were capable of carrying out the duties which they would be asked to perform if these amendments were passed.

Dr. DAVIES said he was sorry to say that he was in direct opposition to both Sir P. Pilditch and Mr. Womersley, and he hoped the Minister of Health would not accept the amendment. He spoke as one who had some experience as a part-time medical officer of health. These part-time medical officers of health practically attended their office every day of the week except Sunday. The medical officer of health was responsible for the health of the district, including sanitation, and the sanitary inspector was directly under the control and orders of the medical officer of health. In a well-managed local authority the sanitary officials were very highly qualified men, who received the respect and support of their medical officers. But in his own experience the sanitary inspector always operated through him. If they made it possible for the sanitary inspector to make official representations to the local authority over the head of the medical officer of health, as he could do if these amendments were accepted, it would immediately cause a rift between the medical officer of health and the sanitary inspector. If the sanitary inspector had a definite opinion which did not meet with the approval of the medical officer of health, and acted over the medical officer's head, there would be divided responsibility, friction, and a very unhappy state of affairs. In local authorities and departments it was essential to have discipline. He did not desire to interfere with the status of the sanitary inspector in any way. After the medical officer of health he was the most important man in the health department of a local authority. But the medical officer of health was ultimately responsible, and if he could not trust his sanitary inspector it meant more work for him.

EXCLUSION OF THE SANITARY INSPECTOR.

Mr. McSHANE said he was very far from satisfied with the express exclusion of the sanitary inspector from the Bill, and he was not satisfied, considering this Bill in relation to the Mental Treatment Bill, with the further advance of medical officers. They were being very powerfully represented in that House in discussing measures which came before it. He denied any conflicting control whatever. No one would say that because the sanitary inspector was recognised in the Housing Act of 1925 it really caused any division of responsibility or conflict of control. He was not arguing on behalf of the Sanitary Inspectors' Association, as such, but because the sanitary inspector did the most valuable work he ought surely to be recognised as part of the official representation of the machine. The local authority had the ultimate responsibility, not any of its officials.

Mr. GREENWOOD (Minister of Health) said many of them were familiar with the procedure whereby particular interests—and he used that phrase in no invidious sense—did their best to exploit a situation in Parliament. He did not blame particular groups of people for trying to advance their interests in that way, but he must object to being drawn into this controversy between the sanitary inspector and the medical officer of health. His object in that Bill was not to improve the status of sanitary inspectors. He would like to see their status improved, but rightly or wrongly, their general objective was to secure a position as independent officers of a local authority. He contended that in a Housing Bill he should not be required to make a fundamental change in the structure of local government in this country. Such a request could only complicate the situation.

Sir P. PILDITCH: May I suggest that you are making the change? The amendments are designed to retain the law as it stands at the moment.

EXERCISE OF DEFAULT POWERS.

Mr. GREENWOOD said that was not the case. The real conflict was this. In this Bill the only change made in the position of the sanitary officer was with regard to default powers exercised in two kinds of local authorities only: rural district councils and metropolitan boroughs. He had to admit that that power was taken away from them. What was being asked for was an enlargement of their powers; in effect that the local authority should have an additional independent officer and be put in the position of having to decide between the two, with both appearing with equal authority before the council. He did not in any way burke this issue. He took the opportunity of ascertaining the considered views of the Association of Municipal Corporations in this matter. After all, both medical officers of health and sanitary officers were employees of local authorities, and the authorities were primarily concerned. In a letter which had been sent by the Association to the Ministry of Health, they stated their opinion that the medical officer, as head of the health staff, should only be mentioned. It was thought, the letter added, that grave difficulties might arise if a sanitary inspector were given a statutory right which would enable him to act independently of, and possibly in conflict with, the medical officer. In these circumstances the Association expressed the hope that he (the Minister) would not accept these amendments. He hoped that the Committee would support the deliberate view of the Association of Municipal Corporations.

Miss RATHBONE said that she thought that the Minister should leave the sanitary inspectors their powers in rural districts and metropolitan areas. If the case of the Minister had any strength at all it applied only to those authorities who had a first-class medical officer of health who was supreme. Rural areas where the sanitary inspector had exercised this kind of authority were just the areas where it was possible that a part-time medical officer, who was in general practice, might be unduly timid in making representations against the property of people who were his private patients. The sanitary inspector was always a full-time officer, and was not liable to that temptation.

Mr. HASLAM supported the view of the Minister of Health. Some hon. Members seemed to think that because a medical officer of health in a rural district was a part-time officer he was not very efficient. He protested against that point of view. No man was more fitted to give an opinion on housing conditions in rural areas than the medical officer whose whole life was spent in visiting patients in all conditions of life.

DISGRACEFUL CONDITIONS IN RURAL AREAS.

Mr. KINLEY said that those who had seen the disgraceful condition of some of the small property in rural areas thought that there was a case for the appointment of a full-time medical officer of health, or, if that was not possible, of a full-time sanitary inspector to cover the area.

Mr. GREENWOOD asked the Committee to put aside all talk about the extraordinarily efficient service of the sanitary inspectors compared with other services. They were all on much the same footing. Miss Rathbone had asked why they should not retain the powers which sanitary inspectors now enjoyed with regard to default in rural areas and metropolitan boroughs. What was the good of keeping these powers when this efficient service had never exercised them? These default powers had been a dead letter ever since they were placed on the Statute Book, and one of the purposes of this Bill was to simplify the default procedure and to make it more effective. There was no point in keeping machinery which had not worked and which was never likely to do so. It was now urged that under the 1925 Act sanitary inspectors had certain powers, but there was nothing in this Bill which interfered with that unless it was held that the expression "information in the possession of" the local authorities did not include the information received from sanitary inspectors. If it would help the Committee, however, he was willing to insert words in Clause 14 and in Clause 16 at a later stage to include officers of local authorities.

Sir P. PILDITCH said that so far as he was concerned, and he thought so far as Mr. Womersley was concerned, they realised that the Minister had done his best to meet them. It was a difficult point, but he thought that the right hon. gentleman's suggestion would meet their views in substance, though not perhaps so fully as they would desire.

The amendments were by leave withdrawn.

THE OVER-RIDING COUNTY COUNCIL.

Captain GUNSTON moved an amendment to leave out the word "county" in Subsection (1), and to insert instead the word "rural." He said that in Clause 44 they found a definition of the term "official representation" for the purposes of the other clauses of the Bill. Under this clause the medical officer of a local authority could make representations, but the clause went considerably further because it allowed the medical officer of the county council to over-ride the medical officer of an urban district council. He moved this amendment on behalf of the Urban District Councils' Association. That Association recognised that this was a good Bill as a whole, and that an effort was being made to secure amalgamation and coördination between various local authorities; but they protested against the attempt to draw an artificial distinction between a borough and an urban district. It was most undesirable that the discretion of the urban district council and the urban district medical officer should be interfered with by the county council, or the county medical officer. Those connected with urban government were not aware of any instances where urban councils had failed to carry out their duties under the Housing Acts, and he hoped that the Minister would show to the urban district councils more sympathetic consideration in this instance than he had shown in the past.

Dr. DAVIES said that under the proposal in the Bill the county medical officer could go into any district and if he found anything which did not meet with his approval, instead of seeing the district medical officer and asking him if something could not be done about it, he could simply go back to his headquarters and make a definite report to the county council that in a certain district such and such things had been neglected. This was bound to cause a terrible amount of friction and trouble between the county medical officer and the district medical officer, and to disturb the harmony which at the present time existed largely throughout the country.

Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that what they were doing in this clause was to re-enact the law as it had stood since 1890. All the happy relations described by Dr. Davies had grown up under the very clause which was being put back into this Bill. That, she thought, was a sufficient answer to the argument that the arrangement would cause friction and suspicion.

On a division the amendment was negatived by 22 votes to 8.

POWERS OF URBAN DISTRICTS.

Dr. DAVIES moved an amendment with the object of providing that the medical officer of health of an urban district should not be placed in a position of subjection compared with a borough medical officer. He said that this was not the time to draw invidious distinctions between large urban districts and small county boroughs.

Miss LAWRENCE said they were not drawing a new distinction, invidious or otherwise, but merely repeating what was in the Act of 1890. It was perfectly true that there were some urban districts that were as large as certain boroughs, but the bulk of the urban districts were very much smaller than the boroughs. She understood what the urban district councils were after: they desired to be boroughs. But the sensible thing to do was not to increase the powers of urban districts and assimilate them as closely as possible to those of boroughs; the sensible thing was to promote the great growing urban district populations to the full power of boroughs.

The amendment was negatived.

Captain GUNSTON moved an amendment to include urban districts having a population of 20,000 within the scope of the clause. He said he understood that the Parliamentary Secretary would accept this amendment.

Miss LAWRENCE accepted the amendment which was agreed to.

Clause 44, as amended was ordered to stand part of the Bill.

ALTERNATIVE ACCOMMODATION.

Major MILNER moved a new clause enabling a local authority to deal with cases where new houses had been provided, and it was desired to render alternative accommodation available for other persons in other houses belonging to the authority which were better suited to the requirements of the displaced persons. The clause also enabled the rents to be adjusted accordingly.

Mr. GREENWOOD, in accepting the clause, said it was largely an agreed one with the local authorities. It gave the local authorities a little power of interchange, and enabled them to mobilise all their housing resources in a better way. But there was nothing in the clause which required a local authority to build one house the less.

Lieut.-Colonel FREMANTLE said he was very grateful to the Minister for accepting this new clause.

The clause was read a second time and added to the Bill.

UNDERGROUND LIVING ROOMS.

Mr. HARRIS moved a new clause prohibiting the use of underground living rooms in London. He said that the clause had been considered at great length by the London County Council, and had been very carefully drafted.

Mr. GREENWOOD said this was not a clause the subject matter of which demanded different treatment as between London and the provinces. There might be a case for dealing with underground living rooms, but if they were to deal with them it must be done in a different way from this clause. If the committee felt that this was a matter which ought to be dealt with in the Bill he was prepared to consider on the report stage giving the principle general application.

Mr. HARRIS said he was satisfied with the undertaking, and would withdraw the clause.

The consideration of the Bill in committee was completed, and the measure was ordered to be reported to the House.

HOUSE OF COMMONS.

THURSDAY, JULY 3RD.

Factory Inspection in England.

Mr. GRAHAM WHITE asked the Home Secretary the number of new factories which had come under the factory inspectorate in the Midlands and the South, respectively, in the last five years.—Mr. CLYNES replied: The Midlands and the South are divided up for purposes of factory inspection into several divisions, and the following table will show the increase in the number of factories during the last five years in each of the divisions concerned:—

NUMBER OF REGISTERED FACTORIES IN MIDLAND, EASTERN, SOUTH-EASTERN, SOUTHERN, AND WESTERN DIVISIONS AT END OF 1924 AND 1929.

Division.	Number of Registered Factories.		
	At end of—		Increase.
	1924.	1929.	
Midland (*a*)	14,975	15,329	354
Eastern (*b*)	12,472	12,877	405
South-Eastern (*c*)	17,843	20,974	3,131
Southern (*d*)	16,900	19,421	2,521
Western (excluding Wales and Monmouthshire) (*e*)	8,492	9,066	574

(*a*) Counties of Warwick, Worcester, Stafford, and Shropshire.
(*b*) Counties of Nottingham, Leicester, Rutland, Lincoln, Norfolk, Cambridge, Huntingdon, Northampton, and Bedford; parts of the Counties of Buckingham, Hertford, and Suffolk.
(*c*) Counties of Essex, Kent, and Sussex; parts of the Counties of London, Surrey, and Suffolk.
(*d*) Counties of Middlesex, Berkshire, Oxford, Hampshire; parts of the Counties of London, Hertford, Buckingham, Surrey, and Dorset.
(*e*) Counties of Gloucester, Somerset, Wiltshire, Devon, and Cornwall; part of the County of Dorset.

Parents' Neglect of Child's Eyesight.

Mr. FREEMAN asked the President of the Board of Education whether his attention had been called to the case of Cyril Ford, aged 12, Raglan-road, Broad-street School, Bromley, Kent, who was forcibly given treatment to his eyes in May, 1930, by the representative of the school medical officer without the consent of his parents; and under what authority this treatment was given.—Sir C. TREVELYAN replied: I am informed that this boy was found at medical inspection to be suffering from a severe defect of the eyes and that he subsequently, with the full knowledge of his parents, attended the school clinic for a more thorough examination. Drops were put in the boy's eyes in the usual way to make the examination possible, but no treatment was given. The parents were then advised that the boy needed spectacles, but they refused to allow spectacles to be provided. In the last resort the National Society for the Prevention of Cruelty to Children initiated police-court proceedings, which resulted in the imposition of a fine for neglect.

Vivisection Experiments.

Mr. FREEMAN asked the Home Secretary whether he was now in a position to state the number of experiments conducted by vivisection during 1929; and, if so, how many were conducted on dogs and cats and how many when inspectors were present in each case.—Mr. CLYNES replied: The number of experiments performed during 1929 was 403,141; 2523 experiments were performed on dogs and cats under certificates E an EE. I presume the last part of the question is intended to refer to the presence of an Inspector at the actual operation in the case of those experiments which involve some operative procedure. If so, the answer is 157. The cases, however, in which the

experiment involves an operative procedure form only a very small proportion of the whole number, and the Inspectors, in the course of their visits, saw and examined many animals under experiment.

Osteopaths and Legal Recognition.

Mr. FREEMAN asked the Minister of Health whether it was his intention to introduce legislation to amend the Medical Act, 1858, so as to procure recognition and independent regulation of osteopathy, and give its properly qualified practitioners a legal status equivalent to that enjoyed by other recognised professions.—Mr. GREENWOOD replied: The answer is in the negative.

Committee on Sickness and Disablement Claims.

Dr. MORRIS-JONES asked the Minister of Health whether the committee of investigation into the causes of the increased sickness and disablement claims amongst insured persons had completed its deliberations.—Mr. GREENWOOD replied: No, Sir. The committee is still actively engaged in its investigation of the problem.

MONDAY, JULY 7TH.

Diphtheria and Antitoxin Treatment.

Mr. LLEWELLYN-JONES asked the Minister of Health whether he could furnish statistics for the decennial periods 1890–99, 1900–09, 1910–19, and 1920–29, indicating the average yearly number of notified cases of diphtheria in England and Wales, and the average yearly number of fatal cases of diphtheria during each period; and at what date approximately the use of the antitoxin treatment of diphtheria became general.—Mr. GREENWOOD replied: The following table gives such particulars as are available:—

	Average yearly number of	
	Cases notified (excluding non-civilians).	*Deaths* (including non-civilians).
1890–99	Not available	 7648
1900–09	,,	 6599
1910–19	*49,844	 4922
1920–29	54,484	 3486

* The average number for the period 1911–19. The first complete record of notifications of infectious diseases in England and Wales was for the year 1911.

As regards the second part of the question, I am advised that antitoxin was widely used by 1910 when local authorities were first empowered to supply it gratuitously.

War Pensioner's Medical Condition.

Mr. JOWETT asked the Minister of Pensions whether he would inquire into the case of F. C. Colman, ex-driver 21,729, Army Service Corps, discharged from the Army in July, 1918, suffering from duodenal ulcer, for which disability he was pensioned on the ground that his disability had been aggravated by war service, the pension being discontinued in November, 1921, consequent on a decision, after medical examination, that aggravation had passed away; and whether, having regard to the medical certificate recently submitted to him, which stated that F. C. Colman was still suffering from duodenal ulceration, although he was operated on three years ago for duodenal ulcer, he would reconsider his decision that aggravation had passed away.—Mr. F. O. ROBERTS replied: Mr. Colman's case has been fully reviewed, but the medical certificate referred to relates, not to the present time, but to the man's condition eight years ago and prior to the decision of the independent Pensions Appeal Tribunal in the case. In the circumstances, as I have already informed my right hon. friend, there are no grounds on which I should be justified in continuing further action.

Cost to Local Authorities Under New Housing Bill.

Dr. VERNON DAVIES asked the Minister of Health if he could give any estimate of the percentage of the cost per house to be borne by local authorities under the Housing (No. 2) Bill at the present level of building prices.—Miss SUSAN LAWRENCE replied: At the present level of average building prices a contribution of £3 15*s.* per house for 40 years is equivalent to rather more than 16 per cent. of the total cost per house.

TUESDAY, JULY 8TH.

Regulation of Hours in Offices and Commerce.

Sir KINGSLEY WOOD asked the Minister of Labour whether the position of salaried employees, and the convention for the regulation of their hours, had recently received her consideration in connexion with the Washington Convention; whether she had received any representations from any trade organisations in connexion therewith; whether the matter had been the subject of discussion at the recent International Labour Conference at Geneva; and whether any conclusions were reached at such conference.—Mr. LAWSON (Parliamentary Secretary to the Ministry of Labour) replied: The International Labour Conference on June 28th last adopted a draft convention concerning the regulation of hours of work in commerce and offices. Before the Conference met my right hon. friend received various representations from organisations interested in the subject.

The Calmette Treatment.

Mr. FREEMAN asked the Minister of Health the result of the inquiries of the representatives of the Medical Research Council into the death of 20 infants in Lübeck, Germany, following the Calmette prophylactic treatment.—Miss SUSAN LAWRENCE replied: No, Sir; but my right hon. friend understands that a report to the Medical Research Council on the subject of these inquiries is in preparation.

Subsidised and Non-subsidised Houses.

Mr. HORE-BELISHA asked the Minister of Health how many houses had been built during the 12 months ended June 25th, 1930, showing separately the number built with State assistance and private enterprise, respectively, and the corresponding figures for the previous 12 months.—Miss SUSAN LAWRENCE replied: Figures for houses built without subsidy of a rateable value not exceeding £78 (or £105 in the Metropolitan Police District) are only available in respect of the six months periods ending in March and September respectively. The figures for the 12 months ended in March are as follows:—

Year ended March 31st.	Private enterprise (A) with and (B) without State assistance.		Local authorities.	Total.
	(A)	(B)		
1929	64,740	49,069	55,723	169,532
1930	90,086	50,124	61,850	202,060

Miners and Silicosis.

Mr. JENKINS asked the Home Secretary the number of miners who had applied for compensation as a result of suffering from silicosis; what number had been paid compensation; and what number had been refused and the reasons for refusals.—Mr. CLYNES replied: The returns so far received show that there were 12 cases from coal-mines in 1929 in which compensation was paid for silicosis. I regret I cannot give the number of claims refused or reasons for the refusal.

GUY'S HOSPITAL.—The report for 1929 shows that the number of in-patients was 11,800; in 1924 it was 10,017. There was a decline of about 2 per cent. in the out-patients, but an increase in their attendances, which numbered 547,861. The dental department authorised 1417 dentures, much the highest record for any one year. There are 646 available beds, and the average stay of each patient has been reduced from 18¾ to 18 days, the most marked reduction being in the medical cases. The average weekly cost of each in-patient was £4 16*s.*, a fall of 4*s.* 5*d.*; out-patients cost 7*s.* 8*d.* Upon the year's expenditure of over £180,000 the adverse balance was £4535.

ROYAL VISITS TO HOSPITALS.—On Friday last week the Queen visited Queen Mary's Hospital for the East End, and received purses on behalf of the institution. The Duke of Gloucester, President of the hospital, presided at the ceremony. Her Majesty and the Duke afterwards visited some of the wards and the nurses' home.—On the previous day the Prince of Wales opened the new Monkwearmouth and Southwick Hospital, which has cost £100,000 and expressed his satisfaction that it is already paid for. There are about 100 beds, nearly double the accommodation of the old building, which is now almost entirely surrounded by factories.—On the same day Prince Arthur of Connaught opened the new general hospital at Margate, which has cost nearly £70,000. There are 80 beds and X ray and ophthalmic departments.—Recently Prince George opened the new men's ward of the Buchanan hospital at Hastings, and Princess Mary opened extensions, costing £14,500, to the Northwood, Pinner, and District Hospital. The enlargements increase the accommodation to 36 beds.

MEDICAL NEWS

University of Oxford.

At recent examinations the following candidates were successful:—

Medicine, Surgery, and Obstetrics.—A. D. C. Bell, W. D. T. Brunyate, J. H. Chitty, Amy C. E. Clarke, T. M. Davie, J. A. Eddy, A. J. Gibbs, Arthur Guirdham, R. D. Harding, Eugene Hardy, Frank Hawking, K. N. Irvine, W. H. McMenemy, W. E. S. Merrett, C. N. Milner, J. N. O'Reilly, T. R. Plummer, and Victoria M. Robinson.

Pathology.—Gerald Ashton, D. S. Bateman, J. H. B. Beal, R. A. Beaver, J. M. L. Burtenshaw, T. M. Davie, M. S. Good, I. H. Gosset, W. H. Greany, A. L. Jacobs, R. Kempthorne, R. C. MacKeith, R. M. Marshall, M. W. C. Oldfield, Robert Pakenham-Walsh, W. G. Rees, J. R. Robertson, W. L. Rusby, R. B. Scott, and J. H. C. White.

Forensic Medicine and Public Health.—A. D. C. Bell, I. M. Bell, A. J. Gibbs, H. C. Harley, Eugene Harvey, M. A. Hatt, Winifred Mercer, N. L. Rusby, and J. A. Scott.

Materia Medica.—A. D. C. Bell, I. M. Bell, Franklin Bicknell, R. H. Bolton, R. R. Bomford, Edward Braithwaite, Alan Carling, C. C. Cobb, H. G. N. Cooper, J. P. Dewsbery, M. S. Good, I. H. Gosset, A. J. Grace, C. E. Greenwood, C. F. Hamilton-Turner, Newton Heath, R. Kempthorne, Mervyn Mandelstan, P. J. W. Milligan, C. N. Milner, H. B. Morris, H. F. Moseley, Hugo Owen, Robert Pakenham-Walsh, J. E. G. Pearson, W. H. A. Picton, T. W. H. Porter, J. R. Robertson, G. E. Scott, F. M. Trefusis, F. G. Ward, J. H. C. White, and E. J. Williams.

The Theodore Williams scholarship in human anatomy has been awarded to Hugh Noel Davis (proxime accessit, Ralph Harrison Gardiner), and the Theodore Williams Scholarship in physiology to Thomas Meurig Williams.

University of Cambridge.

The governing body of Corpus Christi College have awarded to Dr. Reginald Hilton, assistant physician to St. Bartholomew's Hospital, the Copeman medal for research in medical and biological sciences. This medal was presented by Dr. S. Monckton Copeman, F.R.S., formerly a scholar of the college, and Mrs. Copeman. It was designed by Mr. T. H. Paget and struck by the Royal Mint. The present award is the first which has been made.

University of London.

At recent examinations the following candidates were successful:—

D.P.H.

Part I.—Raghunand Behari, Hilda M. P. Bond, Sarah Boyle, Annie C. Easterbrook, Lilian M. Griffiths, Chopra Harban Lal, Marjorie H. James, W. P. Jones, Samuel Lerner, Donald Magrath, R. J. Muzumdar, Edith A. Straker, Helen B. Sutherland, and Irene Yates.

THIRD EXAMINATION FOR B.D.S.

Ronald Lawton and W. M. Sinclair, King's College Hospital; and T. W. E. Pugh, Guy's Hospital.

Royal College of Surgeons of England.

On July 3rd three Fellows, retiring in rotation, were re-elected to the Council for the full period of eight years. The election was uncontested, and the result of the poll was as follows:—

	Votes.	Plumpers.
Sir Percy Sargent	521	43
Victor Bonney	514	52
Robert Pugh Rowlands	497	33

In all 629 Fellows voted, including 110 Fellows resident out of the United Kingdom; in addition 8 votes were found to be invalid.

University of Manchester.

At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B. & CH.B.

W. W. Kay and A. L. Kenyon (with second-class honours), Roland Barnes, Allan Bigham, A. P. L. Blakely, Barbara E. Bleasdale, Edith M. Casasola, Winifred Dean, E. G. Elwell, Margaret M. Ferguson, C. D. Leflaive, G. M. Lendrum, J. C. Nicholson, G. J. Phillips, D. A. Richards, Edward Riley, Bernard Sandler, M. W. Smith, H. W. Thompson, Carl Verity, and N. S. Walls.

Part I., Forensic Medicine, Hygiene, &c.—M. M. Barritt, H. J. Beard, Margaret M. Bodoano, G. B. Carter, Nancy N. Carter, H. B. Craigie, P. M. Crowe, Jane Druker, Benjamin Dunkerly, K. P. Giles, Jessie Goldstone, William Hall, T. S. Heslop, Frank Livesey, Edith A. Longson, J. P. Longworth, Gerald Maizels, Simon Mills, Catherine O'Connor, Gerald Ramage, W. S. Ramsden, Constance M. Rostron, John Scully, J. C. Smith, G. G. E. Smyth, Alice Speight, Colin Starkie, Barnet Stone, Isaac Sutton, Kenneth Todd, and C. H. T. Wade.

D.P.M.

Nicholas Gebbie, H. C. Mulholland, and Benjamin Reid.

University of Birmingham.

On July 5th the following degrees and diploma were conferred.

M.B. & Ch.B.—A. C. Dawes, L. C. Rutter, and K. S. Williams (with second-class honours), E. D. Allen-Price, G. R. Bashford, R. V. S. Cooper, A. L. d'Abreu, Edwin Donovan, Alfred Elliott, Arthur Ingham, C. R. Kenchington, J. P. F. Lloyd, P. T. Merlin, R. L. Moiser, Harriet T. Stephens, T. C. Wilson, W. E. Wimberger, and Barbara E. Woodhead.

L.D.S.—S. D. Rosenberg.

University of Liverpool.

At recent examinations the following candidates were successful:—

M.D.

W. E. A. Burton, R. L. Corlett, Gwyneth Griffith, Muriel B. Hall, A. J. Hawe, E. W. Jones, and Edna E. Mawson.

M.B. AND CH.B. WITH HONOURS.

Class I.—G. W. Causey.

Class II.—Marjorie E. Birch and Honora J. Twomey.

FINAL EXAMINATION FOR M.B. & CH.B.

Regulations of 1923.—Part I.: M. L. Kaufman. Part II.: R. Fairhurst and R. Kossew. Part III.: A. L. Beresford, I. Kossew, and E. H. Williams.

Regulations of 1924.—Part A: F. J. Burke, H. T. Cank, W. J. Chisnall, L. M. Crooks, W. S. Diggle, H. G. Evans, I. Harris, J. H. Hughes, T. L. Hughes, E. R. Jammy, J. A. Jones, O. V. Jones, W. W. Laughland, T. E. Lennon, H. F. Loewenthal, A. J. Martinez, D. F. Morgan, P. B. Moroney, A. L. Potter, J. Sytner, R. H. Thewlis J. V. Tollington, Winifred Walls, A. R. Williams, and A. Wynroe. Part B.: L. G. Anderson, A. Blumfield, W. N. Chalmers, J. W. Cheetham, D. K. Collins, A. Curtis, W. Dodd, P. P. Fox, M. Glynn-Morris, D. O. Hughes, V. S. Hughes-Davies, A. T. Jones, R. P. Kemp, F. R. Kitchin, J. L. Mewton, J. Polonsky, W. J. Poole, M. Solomon, T. P. Twomey, and R. Wright.

D.P.H.

Part I.—A. Ashworth, Elizabeth M. Harding, and R. Krishna.

D.T.M.

K. C. McKenzie.

D.T.H.

G. R. Baxter, T. T. M. Chen, J. H. Dobbin, R. A. Heatley, G. B. McHutchison, E. S. R. Menon, C. K. Row, and T. Wilson.

Royal Medical Benevolent Fund.

During the first six months of this year the committee have voted £5208 in grants besides the usual payments to the annuitants. At the last meeting £646 was voted to 35 applicants. The following are examples of the cases helped:—

Widow, aged 43, of L.R.C.P. & S. Husband died in November, 1929, of tuberculosis contracted during the war. He gave up his town practice three years ago in order that he might work in the country. He was, however, unfit to do much work and such practice as was secured is not now saleable. The widow has been left with £150, no income, a boy 10 years old. Fund voted £26 and the committee have asked the Guild of the R.M.B.F. to assist the widow to find employment. The boy will be a candidate for Epsom. The Fund will keep in touch with the case, will ask other charities to assist, and will give further help from time to time.

M.R.C.S., aged 57. Has recently had a stroke and had to give up work. He is too ill to attend to his own affairs. The wife applied for help towards the education of the two children. Private income £200; it is not expected that the practice will sell for more than £650. Boy, aged 15, has one more year at school to finish, fees £120. Girl, aged 12, at school, fees reduced £30 a year. It is of the greatest importance that the boy should have his final year at school, after which he will be able to earn. Fund has agreed to pay £45 towards boy's school fees and will ask other charities to contribute towards the balance.

Daughter, aged 61, of M.R.C.S. Has been employed in an office, but has been seriously ill for many weeks. Sick pay of 12*s.* a week ceased on May 8th. She has now only £30 a year from another charity. Medical report stated that it would be a long time, if ever, before she could resume work. Voted £18 to be paid during the next six months when the case would be further considered. In the meanwhile medical comforts and service will be rendered by the Guild.

Subscriptions and donations should be sent to the hon. treasurer of the fund at 11, Chandos-street, London, W. 1.

Royal Medico-Psychological Association.

The eighty-ninth annual meeting of this association was held at Oxford from June 30th to July 4th. The business meeting was presided over by Dr. Nathan Raw, and the remaining sessions by his successor as president, Dr. T. Saxty Good, who delivered an address on the History of Littlemore Hospital. The membership, it was stated, has risen to 819.

Industrial Accidents and Diseases.

The sixth International Medical Congress on Industrial Accidents and Diseases will be held in Geneva during August, 1931. All information may be obtained from the Secretary of the British National Committee for this Congress, Mr. G. L. Perry, Industrial Welfare Society (Incorporated), 51, Palace-street, Westminster, S.W.1.

Fellowship of Medicine and Post-Graduate Medical Association.

On Monday, July 14th at 1.30 P.M., Mr. Mortimer Woolf will give a demonstration in the wards and out-patient department at Queen Mary's Hospital. On Tuesday, the 15th, at 2 P.M., Dr. G. Bourne will give a demonstration on children at the East London Hospital for Children. From July 21st to August 3rd a course in Diseases of Infants will be held at the Infants Hospital, Vincent-square. It will consist of lectures and demonstrations during the afternoons. In August there will be an all-day course at the Brompton Hospital, from August 11th to 16th, and an afternoon and early evening course at the All Saints' Hospital, Vauxhall Bridge-road, from the 5th to the 30th. The Fellowship also arranges for attendance at the clinical practice of some 50 London hospitals. Full particulars may be had from the Fellowship of Medicine at 1, Wimpole-street, London, W.1.

Paddington Medical Society.

At the first ordinary meeting of this society, held on July 8th at the Great Western Hotel, Dr. G. Sweitochowski being in the chair, a short address was given by Dr. G. E. Oates, medical officer of health for Paddington, on public health topics of general interest. Dr. Oates covered in his survey the diagnosis of small-pox, the supervision of rheumatism in children, and some questions of maternal and infantile mortality. On a motion by Dr. A. Baldie, vice-president, a section of the society was constituted for the purpose of examining and reporting in detail on the present working of the National Health Insurance Acts, with special relation to the proposed General Medical Service Scheme of the British Medical Association, and in particular on all questions affecting (*a*) organisation; (*b*) remuneration; (*c*) terms of service. The intention of the society is to have strong local consultative bodies to represent the views of practitioners in the borough. Dr. J. Cohen, hon. sec., reported on the present position of the London Public Medical Service. The next ordinary meeting will be held on August 12th.

Appointments

PEIRSON, T., M.B., Ch.B. Manch., has been appointed Deputy Medical Officer of Health for Plymouth.

Certifying Surgeons under the Factory and Workshop Acts: FREYER, T. D. W., L.R.C.P. Lond., M.R.C.S. (Abergavenny); ROBERTS, L. D., M.B., Ch.B. Birm. (Rugeley, Stafford).

Vacancies

For further information refer to the advertisement columns.

Aberdeen, City of, P. H. Dept.—Asst. M.O.H. £600–£750.
Aberdeen Royal Infirmary.—McRobert Lecturer in Malignant Disease. £800.
Aberystwyth Infirmary and Cardiganshire General Hospital.—H.S. £200.
All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—Hon. Surgical Registrar.
Barnsley, Beckett Hospital and Dispensary.—H.P. £200.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Bath, Royal United Hospital.—H.P. and Asst. H.S. Each at rate of £120.
Bath, Somerset and Wilts. Central Children's Orthopædic Hospital, Combe Park.—H.S. At rate of £120.
Birmingham Children's Hospital.—H.S. At rate of £75.
Birmingham, Dudley Road Hospital.—Jun. Asst. M.O's. At rate of £200.
Birmingham, Midland Hospital, Easy Row.—H.S. £150.
Birmingham, Queen's Hospital.—H.S.'s to Special Depts. Each at rate of £70.
Birmingham, Selly Oak Hospital.—Surgeon. £700.
Blackburn Royal Infirmary.—Res. H.P. £175.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Bristol Royal Infirmary.—H.P.'s, H.S.'s, &c. Each at rate of £60. Also Cas. H.S. and Dental H.S. Each at rate of £80.
British Red Cross Society, Clinic for Rheumatism, Peto-place, Marylebone-road, N.W.—Hon Consulting Surgeons, &c. Also Med. Reg. £350.
Cambridge, Papworth Village Settlement.—H.P. At rate of £100.
Canterbury, Kent and Canterbury Hospital.—H.S. At rate of £125.
Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £75. Also H.S.'s, H.P.'s, &c. Each at rate of £50.
Chesterfield and North Derbyshire Royal Hospital.—H.S.'s. At rate of £175.
Delhi, India, Lady Hardinge Medical College and Hospital.—Radiologist. Rs.750 p.m.
Doncaster Royal Infirmary.—Three H.S.'s, and One H.P. All at rate of £200.
East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. Also H.S. to Special Depts., and Cas. O. At rate of £150 and £120 respectively.
Egyptian University Faculty of Medicine.—Prof. of Hygiene. £E.1500.
Evelina Hospital for Children, Southwark, S.E.—H.P. Also Cas. and Out-Patient O. Each at rate of £120.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. Also H.P. At rate of £175 and £135 respectively.
Halifax Royal Infirmary.—Third H.S. At rate of £125.
Harrogate Infirmary.—Jun. H.S.
Hong-Kong, Medical Department.—Secretary. £800.
Hospital for Sick Children, Great Ormond-street, W.C.—Med. Reg. and Pathologist. £300.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Hull Royal Infirmary.—Asst. H.P. Also Cas. H.S. Each at rate of £130.
Indian Medical Service.—Commissions.
Ipswich Borough Mental Hospital.—Med. Supt. £700.
Islington Dispensary, 303, Upper-street, N.—Temporary Asst. Res. M.O. £20 a month.
Kensington, Fulham and Chelsea General Hospital.—Res. Cas. M.O. At rate of £100.
Leamington Spa, Warneford General Hospital.—Res. H.P. £165.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Leicestershire County Council.—Asst. M.O.H. £650.
Leicester Royal Infirmary.—Cas. H.S. At rate of £125.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool, David Lewis Northern Hospital, Clinical School.—Med. Tutor and Reg. Two Surg. Tutors and Regs. Each £175.
Liverpool Heart Hospital.—H.P. £52.
Liverpool, Hospital for Consumption and Diseases of the Chest, Mount Pleasant.—Asst. M.O. and Pathologist. £150.
Liverpool University.—Johnston Chair of Biochemistry.
Manchester Northern Hospital, Park-place, Cheetham Hill-road.—Sen. H.S., and Jun. H.S. £130 and £100 respectively.
Manchester, St. Mary's Hospitals.—Four H.S.'s. At rate of £50.
Manitoba University.—Asst. Professor of Anatomy. 3500 dollars.
Margate and District New General Hospital.—Res. M.O. £125.
Middlesbrough, North Ormesby Hospital.—H.P. £120.
Miller General Hospital, Greenwich-road, S.E.—Cas.O. £150.
National Hospital, Queen-square, W.C.—H.P. £150.
Newark General Hospital.—Res. H.S. At rate of £150.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Jun. Asst. for Path. Dept. £300.
Newport, Mon., Royal Gwent Hospital.—Hon. Radiologist.
North Middlesex Hospital, Silver-street, Edmonton, N.—Radiologist. £3 3s. per Session.
Norwich, Norfolk and Norwich Hospital.—H.S. £120.
Nottingham General Hospital.—H.S. At rate of £150.
Oldham Royal Infirmary.—Two H.S.'s to Special Departments. Each at rate of £175.
Princess Louise Kensington Hospital for Children, N. Kensington. H.S. At rate of £75.
Reading University.—Independent Lecturer in Agricultural Bacteriology. £400–£500.
Redhill, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.
Richmond, Surrey, Royal Hospital.—Jun. H.S. At rate of £100. Also Hon. Surgeons and Physicians, &c.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Rochester, St. Bartholomew's Hospital.—H.P. and Cas. H.S. Each at rate of £175.
Royal London Ophthalmic Hospital, City-road, E.C.—Two Out-Patient Officers. Each £100.
Royal Naval Medical Service.—Medical Officers.
Royal Northern Hospital, Holloway, N.—Res. Out-patient Cas.O. and Anæsthetist. At rate of £70.
Roxburgh, County of.—M.O.H. £1000.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. for Out-patient Department. £150.
Sheffield, Jessop Hospital for Women.—Registrar and Obstetrical Tutor. £500. Also Asst. H.S. At rate of £100.
Sheffield Royal Hospital.—H.S. to Ear, Nose and Throat Dept. Also Res. Anæsthetist. Each at rate of £80.
Sheffield Royal Infirmary.—Two H.S.'s. Also Ophth. H.S. Each at rate of £80.
Shrewsbury, Salop County Council.—Asst. M.O. £600.
Southampton, Free Eye Hospital.—H.S. £150.
St. John's Hospital, Lewisham, S.E.—Hon. Surgeon, also Res. M.O. £250.
Truro, Royal Cornwall Infirmary.—H.S. £170.
Warrington Infirmary and Dispensary.—Jun. H.S. £175.
West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—Jun. H.P. At rate of £100.
Wigan Royal Infirmary.—H.S. At rate of £150.
Willesden General Hospital, N.W.—Res. H.S. and H.P. £110 and £100 respectively.
Winchester, Royal Hampshire County Hospital.—H.P. £150.
Wokingham, Berkshire, Pinewood Sanatorium.—2nd Asst. M.O. £550.
Wolverhampton Royal Hospital.—H.P. At rate of £150.
Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.
York County Hospital.—Res. Anæsthetist and Asst. H.S. £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Snaith (Yorkshire).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the District of the Marylebone County Court (Circuit 43). Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W.1, not later than July 26th.

NOTES, COMMENTS, AND ABSTRACTS

IMPROVEMENT OF POSTURE.

By M. F. Forrester-Brown, M.S., M.D. Lond.,
VISITING SURGEON TO THE CHILDREN'S ORTHOPÆDIC HOSPITAL, BATH.

Few people seem to realise how far extension and hyperextension of the spine are movements limited to the cervical and lumbar regions, and in which only the parts of the thoracic spine adjacent to these other regions participate. The importance of this fact is that when the normal kyphos of the thoracic spine with its apex at the seventh thoracic vertebra has been increased from any cause, it cannot be effectively reduced by voluntary hyperextension exercises of the whole spine, for the mobile cervical and lumbar regions absorb the whole stress. It is only when these two regions are locked in flexion, or put out of action by suspension, that a hyperextending force has any chance of acting on the centre of the thoracic kyphos.

Another aspect of spinal anatomy that often seems forgotten is that the abdominal cavity is absolutely dependent for its shape on the curves of of the spinal column; while conversely the muscles of the anterior abdominal wall are the anterior stays of the vertebral column, their tension being dependent on its curves and vice versa. Thus if the lumbar lordosis is reduced to a minimum and the abdominal muscles are taut, the abdominal cavity has an inverted pear-shape, which reduces any tendency of the heavy organs in its upper part (like the liver and stomach) to slip downwards; in this position its posterior wall in the loin slopes forwards and downwards, forming a supporting bed for the kidney. If the lordosis is increased, the posterior wall becomes vertical, and any sudden stress from above will much more easily dislocate a kidney. If simultaneously there is poor tone in the body muscles, so that the ribs slope down and the anterior abdominal wall bulges forward, then the pear-shape of the cavity is lost, and all the heavy organs sag downward. It is evident that an operation to suture up one or more of these organs is not a satisfactory or radical way of dealing with the condition. Conversely, lifting of the ribs and retraction of the anterior abdominal muscles reduce the forward pull on the spine and the lordosis, so that the vicious circle is broken at two points (Fig. 1).

Just as there are different types of horse, of which the Clydesdale and race-horse represent the extremes, so also there are different types of human machines, even in the same race. Some are built with heavy bones and short strong muscles and ligaments (Fig. 2, A); others with light bones, loose joints, and atonic muscles (Figs. 2, B and 3). These differences are often exaggerated by disease, for anything which lowers muscle tone in the slender type renders them visceroptotic, so that a vicious circle is produced, while repeated stress on the muscles of the heavy type is apt to induce fibrous changes which stiffen their joints still further. The two types are well represented by the John Bull and the Uncle Sam of the caricaturists. Dr. J. E. Goldthwait,[1] of Boston, has demonstrated by X ray examination that a number of the heavy "stocky" type have only four lumbar vertebræ, while some of the very "long-waisted" ones have six.

Owing to the attachments of the deep cervical fascia, when the chin is thrust forward and there is a cervical lordosis, the strands which pass down to the pericardium are relaxed, so that the heart can sag down and with it the central tendon of the diaphragm, which naturally impairs both circulation and respiration, another of the numerous drawbacks to the kypho-lordotic position of the spine.

[1] Jour. Orth. Surg., 1920, ii., No. 7.

The Pelvic Tilt.

The simplest countryman understands that one cannot put on the top storey of a house until one has built the ground-floor and foundations; yet medical men are constantly trying to alter the position of the upper bricks of the spinal column without adjusting the base on which they stand. In other words, no type of shoulder exercise will put the thoracic spine into a correct attitude until the lower limbs, pelvic girdle, and lumbar spine are successively put into the correct relationship to one another. An excessive tilt of the pelvic ring may be associated with different types of faulty balance above it, but the easy correct balance is practically impossible to attain until the pelvis has been tilted back the right amount by contraction of the glutei, pulling the sacrum down, and of the abdominal muscles, pulling the pubis up, and both together antagonising the powerful iliopsoas. It is probably impossible to over-correct the pelvic tilt by active exercises; on the other hand, when the muscles are relaxed by anæsthesia or by chronic illness and if the patient is kept recumbent on a hard surface—like an operating-table—without any support for the normal lumbar lordosis the lumbosacral and sacro-iliac joints are frequently strained, and become the source of chronic pain for a long time afterwards. A small cushion should therefore always be put under the lumbar region of a recumbent patient. Also, when the lithotomy position is used, care should be taken that the thighs are not flexed to an extreme degree so that the tension on the hamstrings pulls the lower end of the pelvis forward and strains the sacro-iliac joints.

Joints depend for their protection from constant strain, as distinguished from sudden jerks, on the tone of the muscles and not on the ligaments, which are merely a kind of outpost ready to resist surprise attacks momentarily and to call the main army of muscles to their aid. Now the sacro-iliac joints, though crossed by the fibrous origins of the glutei and spinal muscles, are not directly supported by any powerful muscle-group and yet are subject to the stress of the whole weight of the trunk and upper limbs. It is very important, therefore, that the body should be so balanced as to reduce the strain to a minimum, especially after the ligaments have been softened by pregnancy. Increase of the pelvic tilt especially if associated with a pendulous abdomen, will enormously increase the load on these joints, while in rheumatic subjects the strain may localise a rheumatic process; hence the tendency to symptoms in this region after middle age. Similar stresses on the lumbar and lumbo-sacral articulations are apt to be followed by inflammatory reactions in the posterior joints, which lie in intimate relationship with the roots of the nerves of the lumbar and sacral plexuses, so that the symptoms are often referred to the lower limbs although the seat of the trouble is in the back. Sciatica, in the sense of a true neuritis of the sciatic nerve, is rare, whereas sciatic pain referred from faults in the bones and joints of the lower part of the back is very common.

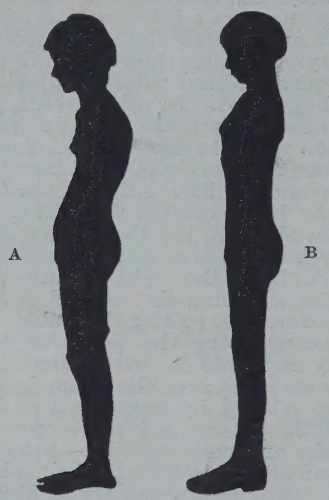
Muscle-Balance.

Joints are too often regarded as hinges, like those of a door, whereas they are living structures, completely under the control of a complex system of muscles, which are themselves balanced through an elaborate network of nerve centres. A "fatigued muscle" is really a fatigued nerve centre, and if the vitality of these centres is diminished by chronic toxæmia, or some other unfavourable general condition, it is not by any system of "exercises" that their function can be improved, but by doing away with the deleterious conditions, and meanwhile resting the centres as much as possible. This explains the value of recumbency in the treatment of postural faults due to malnutrition or chronic disease.

The effects of "exercises" in improving nerve control and muscle "tone" must not be confused with their effects in improving the circulation and the oxygenation of the blood. Thus, exercises directed to produce a series of deep inspirations and complete expirations have a beneficial effect on the whole body by increasing the oxygen content of the blood, emptying the abdominal veins by suction and so reducing the work of the heart, and also, by the swing of the diaphragm and of the abdominal muscles, massaging the liver and intestines (Fig. 4, A and B). All this is independent of the increased control of the trunk muscles that may be gained. Similarly, exercises may have a psychological value, even though they have no value in improving the balance of the spine directly.

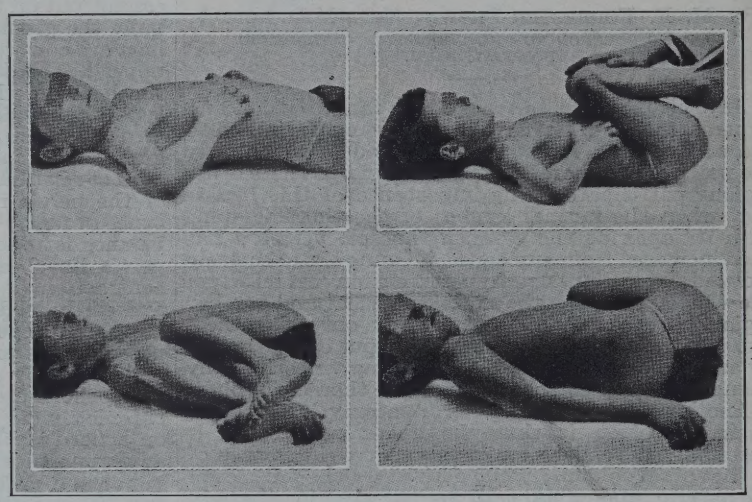
The nerve control of balance is chiefly maintained by a series of reflexes, which are outside the control of volition and which can only be modified indirectly. The sensory receptors for these reflexes are mainly in the eyes and labyrinth, and the reflexes are directed to maintaining the eyes horizontal. This brings me back to my previous contention that it is essential to have a correct attitude for the base of the spine, if the parts above are to assume some particular direction; for once the base is tilted in a certain axis, then the reflexes from the eyes and labyrinth will induce a series of compensatory curves which cannot be altered by any voluntary effort directed to them alone. This is very evident in cases of severe deformity of the spine due to tuberculosis, for in untreated cases the eyes are practically always found facing horizontally forwards, through the spontaneous production of large compensatory curves in all the rest of the spine. Such spontaneous curves often render the deformity very conspicuous, and a large part of the surgeon's art in the treatment of tuberculous spines consists in deliberately localising

FIG. 1.



(*a*) Faulty posture before treatment—rigid so that no improvement is possible at once. Note sagging at knees, prominent abdomen, hollow back, with thoracic kyphos above, dropped ribs, poking chin and hollow at back of neck.
(*b*) Same case after 3 months' treatment by Goldthwait's exercises and recumbency in an open-air hospital. Note straight knees, retracted abdomen, straight spine, expanded chest and back of neck well stretched. This is the position of attention, but even in the relaxed position the patient could not resume her old extreme slouch.

FIG. 4.

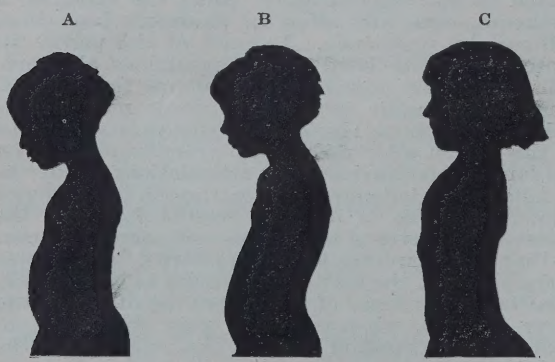


Physical exercises for children.

The *upper* photograph shows full respiration, assisted by knee flexion, for a young child; on the left: inspiration—ribs pulled wide by fingers; on the right: expiration—abdomen compressed by flexed thighs.

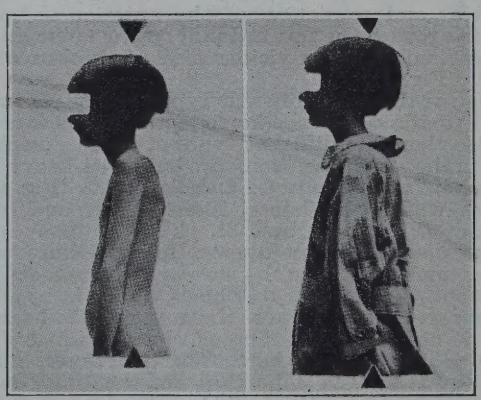
The *lower* photograph shows knee rolling exercises to increase abdominal tone. On the left the knees are seen drawn up into the right axilla while the chest is steadied by grasping the table—i.e., active twisting of the trunk. On the right the knees are seen rolled over into the left axilla, after which the lower limbs will be straightened out and the spine will be stretched.

FIG. 2.



(*a*) Boy of 4 years with extreme faulty posture: heavy type (John Bull in the adult).
(*b*) Girl of 5 years, similar posture; thin visceroptotic type (Uncle Sam in the adult).
(*c*) Girl of 5 years, healthy posture: medium type.

FIG. 3.



Faulty posture in the thin mobile type, easy to correct but hard to maintain. Undressed and dressed, showing how clothes mask the defect.

the compensatory curves in such a way that they shall be inconspicuous. It is rarely possible to prevent the collapse of some vertebral bodies, which is inevitably followed by the projection backward of the corresponding spinous processes. In the lumbar region, where a lordosis is normal, such a degree of kyphos merely renders the lumbar spine rather straight, a deformity not noticed by the lay eye. Moreover, in this region the position of the posterior articulations allows one vertebra to settle down vertically on to the one below, with no alteration in the angle. Such a settling-down is impossible in the mid-thoracic region, owing to the length and obliquity of the spinous processes, as well as to the arrangement of the posterior articulations. Therefore tuberculosis in the mid-thoracic region gives the most marked deformity, and is most difficult to mask by any form of treatment. Of course, if the patient with such a kyphos is allowed to walk at an early stage, there will be increase of the deformity, not only by further collapse of softened, tuberculous bodies but also by the action of the postural reflexes. Moreover, the erector spinæ in the thoracic region, besides being weakened by the toxins of the disease, has to work round a convexity, and is at a mechanical disadvantage in comparison with the same muscle acting across the concavity in the lumbar and cervical regions; the greater the kyphos the greater the mechanical disadvantage. In the upright position there is practically no apparatus which will counteract the deforming forces of these three factors.

Conclusions.

The practical conclusions of the above observations are:—

1. Increase of any one of the normal curves of the spine is associated automatically with increase of the other two, and in correcting them it is essential to begin with the lowest curve, so that the natural reflexes may assist instead of hindering the reduction of the other two.

2. Lumbar lordosis has a pernicious effect on the abdominal organs, kyphosis on the expansion of the lungs, and cervical lordosis on the heart and respiration.

3. All corrective exercises must aim at increased nerve control and balance, and defects of muscle-tone must be treated by a due proportion of rest, while the extensors of the spine cannot be usefully developed apart from the abdominal muscles (Fig. 4, C and D).

MEDICINA IN NUMMIS.

To the Editor of THE LANCET.

SIR,—The University of Vienna is in possession of one of the largest and most important collections of medical medals which was collected by the well-known research scholar Dr. Josef Brettauer of Trieste, who died in the year 1905. The collection, named the Brettauer Collection, after the donor, comprises some 7000 medals, among which there are artistic and historical works of great value of Renaissance, baroque, and modern art. This collection covers a wide field, and offers still unexhausted sources to the student of medical history. There are three chief groups. The first group concerns physicians of all times and nations, the second epidemics (especially plague, smallpox, cholera), famine, and want. The third group comprises, in many subdivisions, medals referring to healing gods and patrons of medicine, hospitals, and welfare institutions, medical corporations and congresses, nursing, ambulance, nearly all special branches of medicine and the medical auxiliary sciences, pharmacy and veterinary science, besides amulets, professional jetons, and satirical medals.

The control of this precious collection was recently transferred to the medal cabinet of the Art-History Museum. In accordance with the regulations of the foundation deed a small selection is exhibited for public inspection. The collection itself, which is in the exhibition room of the federal collection of medals, coins, and money-tokens, is open to all interested in this branch of science. Students of numismatics both here and in other countries are showing great interest in this unique collection, with highly satisfactory results.

The publication of a scientific catalogue of the collection, provided with the necessary photographs and drawings, &c., of medals of special historical importance is extremely desirable. As the cost of such a catalogue, which is estimated at least at 10,000 schilling (Austrian shillings), cannot be covered altogether by a donation of the Austrian Government, the undersigned apply, on behalf of the committee of the Brettauer Collection, to all friends of science and art, and especially to medical historians and numismatists, as well as to medical faculties, medical associations and societies, both here and abroad, to be good enough to send their contributions to the office of the rector of the Vienna University. A list of donors will be published in an appendix to the catalogue.

On behalf of the committee of the Dr. Josef Brettauer Collection of Coins,

Prof. Dr. WENZEL GLEISPACH,
Rector of the Vienna University.

Prof. Dr. MAX NEUBURGER, President of the Institute of Medical History.
Prof. Dr. AUGUST LOEHR, Director of the Collection of Medals, Coins and Money-Tokens in the Art-History Museum.

STUDENTS' WORK IN THE VACATIONS.

IN increasing numbers each summer English undergraduates are trying to find paid work to occupy their long vacation. There is in this country no tradition in favour of such employment, and now that many students from the middle and working classes find it necessary that they should make some contribution to the family exchequer, the difficulties in the way of their obtaining temporary paid posts are almost insuperable. Writing from the National Union of Students (3, Endsleigh-street, London, W.C.1), Lord Derby suggests that these difficulties are partly due to the reluctance of employers to employ undergraduates in a way with which the last generation was not familiar. He believes that, if more were known of the students seeking such employment, it would be found that there are many temporary posts which they could suitably occupy. In the present summer many hundreds of students are looking for vacation work, and the Union is in a position to introduce suitable applicants to any employer who will apply to the secretary.

EFFECTS OF CASTOR OIL SOAP ON BACTERIA.

THE discovery of W. P. Larson that certain virulent strains of bacteria, when immersed in solutions of sodium ricinoleate, become avirulent was attributed by him to a surface tension effect. This theory was found, however, to be unsatisfactory since other soaps which are effective in lowering surface tension are much less so in detoxifying toxins. Dr. R. R. Spencer,[1] of the U.S. Public Health Service, now publishes a series of observations on the clearing of certain bacterial suspensions by the addition of solutions of sodium ricinoleate. The effect of this solution varies widely according to the species of bacteria. *B. tularense* in suspension of turbidity 250 is cleared immediately with solutions of castor oil soap as low as 1 : 800. No other bacterial suspension is cleared by this low dilution—the distinction is, indeed, so marked that Spencer suggests this technique as a new method for identifying *B. tularense*. Other bacteria are cleared in higher dilutions, *B. pestis*, for example, at 1 : 200 and *Spirillum choleræ* at 1 : 100. Whenever there was a complete disappearance of visible turbidity a marked increase in viscosity occurred.

More remarkable, perhaps, is the increase in turbidity noted in suspensions of *B. columbense* and *B. niger* at certain definite (and in each case specific) dilutions of the sodium ricinoleate. This phenomenon is no more easy to explain than is the fact that many bacteria do not seem to be affected at all.

[1] U.S. Public Health Reports, June 13th.

THE CALDECOTT COMMUNITY.

THE Caldecott community is a school in Hertfordshire where children, chiefly from the slums, are given the advantages of a country boarding-school life. How much they gain from it is fully evident only to those who visit the school itself; but some idea of the success of the experiment can be gained by seeing the plays annually performed by the children. This year they will again have a London evening, and judging by previous experience, it should be well worth going to the Rudolf Steiner Hall on July 17th to attend it. The play is called The Son of Jochebed, and is taken from Edmund Fleg's "La Vie de Moïse." In the words of the preliminary leaflet:—

"You will not see Moses in the Bulrushes, but you will see him strangle the Taskmaster, and the Burning Bush will really burn and not be consumed, to music by Schumann (this is a very difficult part); and, of course, you will see the frogs and the death of the first-born, and the ripples of the Red Sea as the Children of Israel cross it: this will be difficult too, for the sea will move to one rhythm while the Children pass through it to another, and we have to keep our heads as we are sure the Israelites had to: and, of course, you will see Pharaoh and his chariots drowned as well—we couldn't leave that out, however difficult."

Tickets may be had from Miss Potter at the Caldecott Community, Goff's Oak, Cheshunt, and nobody who buys one is likely to regret it.

A MOTOR-CYCLE ACCIDENT.

Mr. Arthur S. Nicoll (25, Ringstead-road, Catford, S.E.6) informs us that he is anxious to get into touch with a medical man who witnessed an accident to a motor-cyclist and pillion-rider, "who was run down by a car on the way to Hastings on Sunday, June 22nd, 12.30 noon." The doctor gave his card at the time, but it has been lost.

ALLERGIC INSULIN REACTIONS.

WHATEVER the chemical nature of insulin may prove to be, it is at present impossible to separate the hormone from the tissue proteins of the animal from which it is prepared, and it is therefore not surprising that its use should be occasionally attended by those local and general reactions which are apt to follow the hypodermic injection of foreign protein. Indeed, the surprising fact is that such anaphylactic reactions are not more often encountered. Local reactions, consisting of an itching area of erythema round the site of injection, were commonly seen during the use of the earlier preparations of insulin, which were rich in protein, and are still met with occasionally. They can usually be avoided by changing the brand of insulin. General reactions of the anaphylactic type are fortunately rarer still, but an almost fatal case described by J. R. Williams[1] emphasises their importance.

The patient, a diabetic boy of 12, had been having insulin injections for over two years, when he suddenly became ill with severe abdominal pain and vomiting. He was unable to retain any food and rapidly developed a ketosis, which could not be controlled by increased doses of insulin. Eventually, when the child was moribund the possibility of an allergic reaction occurred to the author, and on changing the brand of insulin, which was one prepared from the pancreas of the pig, for one made from beef pancreas, complete recovery occurred within 48 hours.

The importance of this case lies in the fact that such a train of symptoms, abdominal pain and vomiting, followed by ketosis, is so typical of early diabetic coma that the clinician can hardly be blamed for not suspecting the true state of affairs. A certain proportion of cases of diabetic coma do not respond to insulin treatment, and it is well worth bearing in mind the possibility of an anaphylactic reaction to the insulin in such circumstances. Certainly no harm can be caused by trying a different preparation of insulin. As Dr. Williams suggests, it would be helpful if manufacturers indicated on the package the animal source of their extract.

[1] Jour. Amer. Med. Assoc., 1930, xciv., 1112.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, July 14th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear, Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, July 14th, to SATURDAY, July 19th.—QUEEN MARY'S HOSPITAL, Stratford, E., Mond., 1.30 P.M., Demonstrations in Wards and O.P. Dept. by Mr. Mortimer Woolf. No fee.—EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E., Tues., Demonstrations in Diseases of Children at 2.0 P.M., by Dr. G. Bourne. No fee. Further particulars from the Fellowship of Medicine.

MENTAL HOSPITALS ASSOCIATION, 5, Church-passage, Guildhall, E.C.

WEDNESDAY, July 16th.—11 A.M., Annual Meeting at Guildhall, London, E.C.

Births, Marriages, and Deaths

BIRTHS.

AINSCOW.—On June 23rd, the wife of Dr. J. Arthur Ainscow, Hagley-road, Birmingham, of a son.
BARNARD.—On June 28th, at Aboyne, Sidcup, the wife of Dr. J. M. Barnard, of a son.
BRIDGES.—On July 1st, at "Hutton," Pampisford-road, Purley, wife of Major R. F. Bridges, R.A.M.C., of a daughter.

DEATHS.

CONAN DOYLE.—On July 7th, at Windlesham, Crowborough, Sir Arthur Conan Doyle, M.D., LL.D., in his 72nd year.
FALKNER.—On June 28th, suddenly, from heart failure, Henry George Falkner, O.B.E., L.R.C.P. & S.I., of Park-crescent, W.
GERVIS.—On June 30th, at Shepway, Seaford, Sussex, Charles Berkeley Gervis, M.D., M.R.C.S., L.R.C.P., aged 54.
TAYLOR.—On July 1st, at West Heath-drive, Golders Green, Frank Edward Taylor, M.A., M.D., M.Sc., M.R.C.P., F.R.C.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

PLYMOUTH CITY COUNCIL: LOAN FOR PURCHASE OF RADIUM.—The Council has decided to borrow £24,000 for the purchase of radium, the Ministry of Health having promised to consider the proposal in the same way as every other application for a loan. The health committees of Devon and Cornwall will participate in the scheme. In 1928 there were 340, and in 1929 297 deaths in Plymouth from cancer. It is expected that 20 beds will be set aside, one half for the counties of Devon and Cornwall, and the other half for Plymouth.

RECOVERY OF HOSPITAL EXPENSES.—Under Section 16 of the Local Government Act, 1929, local authorities are empowered to recover the cost of maintenance of patients in hospitals, maternity homes, and such like institutions, either from the patients themselves or from those legally liable to maintain them, exception made of cases of infectious disease and of cases where the authority is satisfied that exemption ought to be granted in respect of part or all of the cost. Plymouth has now drawn up a comprehensive scale of charges and exemptions based upon income and the number of the family. The exemptions range from incomes of £104 to £250—one in family in the first instance and eight in the last. Liability to the full charge begins at £208 (one in family) and goes up to £400 (eight in family). There are, however, three intermediate scales fixing the proportion of the cost to be recovered at 25, 50, and 75 per cent., according to income.

ADDRESSES AND ORIGINAL ARTICLES

NEUROHYPOPHYSIAL MECHANISMS FROM A CLINICAL STANDPOINT.*

By Harvey Cushing, M.D., C.B., F.R.C.S. (Hon.),
PROFESSOR OF SURGERY, HARVARD UNIVERSITY.

Joseph Lister, in whose name this triennial lectureship has been established, was a practitioner of surgery and at the same time a savant—or as near an approach to one as the definition of the term can permit a surgeon to be. It is a rare combination, for the two careers are well-nigh incompatible, one or the other of them, by those capable of either, usually having to be sacrificed. Science demands of the true savant a devotion which admits of no sharing; wholly unconcerned with the application of theory, he consecrates himself to a form of intellectual activity which brooks little or no interruption. The surgeon's time, on the other hand, lies open to the behest of afflicted persons who in mounting numbers seek his aid; and if he is at all benevolent, they cannot be refused. Seldom, therefore, can the diverging paths be long trodden together; the straddle becomes too great.

Those fully qualified and who have essayed to lead the double life have usually found themselves burdened beyond sufferance. In spite of his unlimited capacity and passion for work, this, in our own time, was the experience, if I mistake not, of that man of superhuman standards, Victor Horsley. John Hunter, who also kept up the divided allegiance throughout a life of unparalleled industry, was constantly harassed by obligations to his patients though they provided the guineas needed for his researches. Others like James Paget, who once said: "There is nothing that a man may not be at the same time that he is scientific," have taken the Vesalian course ultimately, after a brave start, to abandon their scientific pursuits altogether. Lister alone of those whose names come readily to mind had the placid disposition which enabled him to carry the double burden with equaminity. The major problem, to be sure, which he set himself to solve was born from the urge of practical necessity, but this was no less true of many of Pasteur's more important later researches. Each none the less remained a savant for all that.

To invoke these great names within the walls of this College merely serves to emphasise that most surgeons become increasingly involved in the snare of their practical work, the worries and responsibilities of which allow neither leisure nor that freedom of thought necessary for productive research. The time comes when most of them at best merely provide opportunity, stimulus, and possibly ideas and material for younger people to work upon; and yet the high regard in which science is held in these halls is shown by the fact that from Richard Owen to Arthur Keith a true savant has been Conservator of the great museum in which the memorials and traditions of Hunter's scientific labours survive.

What personal contributions, therefore, surgeons in their later years are likely to make to the store of scientific knowledge rarely causes any great stir. So what I shall have to say in this Lister lecture, on a subject which from small beginnings has grown beyond what any one person can readily compass, has mostly to do with the clinical interpretation of the recent discoveries made by others with some few of whom I have chanced to come into close working contact. And should Lister with Hunter and Paget and Horsley happen to look down from the spirit-world upon this gathering, my topic in spite of its modern aspects and terminology will not be wholly foreign to them. Hunter was deeply interested in the factors underlying growth in the abstract, Paget in the pathology of tumours, Horsley in the function of the ductless glands, and Lister, by teaching us how to eliminate wound infection, opened both in clinic and laboratory the innermost recesses of the living body to the surgeon's inspection. Had it not been for Lister, surgery would still be mainly "external" rather than largely "internal" as it has become, and we would have known, probably, little more about the region of which I shall speak than was known to Galen, to André Vésale, and to Thomas Willis.

Primitive Views of the Pituita.

Nature saw fit to enclose the central nervous system in a bony case lined by a tough, protecting membrane, and within this case she concealed a tiny organ which lies enveloped by an additional bony capsule and membrane like the nugget in the innermost of a series of Chinese boxes. No other single structure in the body is so doubly protected, so centrally placed, so well hidden. Her acts being purposeful, she must have had abundant reason for this, and man's prying curiosity impels him to ask what they were. But we may as well go back to the beginning.

When anatomists first undertook roughly to describe the brain, they were so baffled by the complexities of the region overlying the sella turcica that the best Galen, the greatest of them, could do was to call it "the seine-like net," and as he thought it an astounding structure those who came, long afterward, to put him into Latin used the term *rete mirabile* rather than the plain *plexus retiformis*. So as the "wonderful net" it continued vaguely to be described until, in the arterial plate of his *Six Tables*, Vésale first essayed to give a picture of it—*Rete mirabile, in quo vitalis spiritus ad animalem preparatur*. This figure was considerably altered when the *Fabrica* came to be published at which time drawings to show the mechanism of pituitary distillation were subjoined; but it was not until well on in the seventeenth century that Willis began to untangle the net by describing the vascular "circle," both arterial and venous, which surrounds it. Of the functional importance of the region Galen had no doubt, and we need not smile with complacence at the idea of its being a filter or trap whence the slime or pituita, the waste product of the transformation in the cerebral ventricles of vital into animal spirits, found its way into the nose and pharynx.

Willis, to be sure, found this explanation untenable, particularly since Schneider before him had demonstrated that pituita or phlegm was secreted by the nasal mucous membranes themselves. But could he have known, what in more recent times comparative zoology and embryology were to teach us, that in ascidian larvæ the ventricle and primitive mouth are in permanent communication, that the hypophysial homologue in amphioxus is a ciliated pit with an external secretion of slime, and that a demonstrable duct actually exists in the embryonic stage of all vertebrates, it would have lent strong support to the

* The basis of the Lister Memorial Lecture delivered, with illustrations, at the Royal College of Surgeons on July 9th, 1930.

Galenic doctrine. And likely enough, one or all of these great men may have encountered examples of cerebro-spinal rhinorrhœa still further to mislead them and confuse the issue.

We may well look charitably upon this ancient belief that the infundibular funnel and the subjacent gland was a mechanism of external secretion, for we are no less puzzled to-day to know what happens at least to the posterior "pituita," it being now the fashion to believe that it passes in the reverse direction—namely, up the infundibular stalk toward the tuber and ventricle; and in all certainty the recently discovered anterior pituitary hormone of sex has much to do with our vitality and animal spirits though no longer brewed in the ventricular cavities.

In his ample discussion three centuries ago of the functions of the *Rete*, of which he had made a comparative study on all available animal species, Willis stated:—

> "The ramification of the carotids into a reticulated plexus shows . . . . that the blood . . . . before it is let into the cerebrum takes some part of the superfluous serum of the pituitary gland and instils another part into the various hoots to be led back toward the heart."

There lies in this statement the kernel of the modern conception of an internal secretion, but the idea was stillborn, and though Harvey by this time had shown what might be learned concerning function by putting things to the test of well-devised experiments, the *Rete* and the gland it covered were well out of experimental reach. And not only out of reach, they went practically out of mind after comparative anatomy finally made clear that in higher animals traces might be found of structures that in lower forms had once been of functional importance. So in our ignorance, the pituitary glandule, newly named (1778) the hypophysis cerebri, was conveniently brushed aside as being of the limbo of vestigial relics.

Humours and Hormones.

Advances in scientific knowledge are based on speculative hypotheses, and the grain of truth they may contain is only established or disproved after disappointment and toil immeasurable. Out of Aristotle's theory of matter with its four fundamental substances—air, water, fire, and earth—grew the conception of the four humours—phlegm, blood, yellow bile, and black bile—over which medicine philosophised so long that our very speech has become permeated thereby. Our temperaments to this day are phlegmatic or sanguine, choleric or melancholy, and are likely so to remain, however much we may talk and write in modern hyper- and hypo-hormonic terms.

All this is intertwined with the age-long observations on the blood which the practice of venesection, both in illness and health, abundantly provided for study. In the formation of the clot the blood (*sanguinis*) and black bile were its solidified portion, the serum was yellow bile, and the supernatant "buffy coat" (*crusta sanguinis*) represented the phlegma on the thickness and character of which the diagnosis of disease largely rested. No observation in the whole history of medicine has played so important a rôle as this phenomenon of clotting which served for two thousand years as the basis of humoral pathology; and the dyscrasias and diatheses of our more immediate predecessors are but the rose by another name.

There came a time, to be sure, when attention was focused (1761) by the *De sedibus* of Morgagni on the solid organs as the seat and cause of disease; but the importance of the body fluids could not long be kept in the background, and soon Théophile de Bordeu, a practitioner of Paris, propounded the view (1776) that each gland and organ provides some specific substance or secretion which, passing into the blood, regulates the physiological integration of the body—an idea that supposedly influenced Bichat in ascribing (1802) a specific vital property to each classifiable tissue.

Not, however, until Claude Bernard's brilliant studies of hepatic glycogen (1853), which supplied the conception of an internal as opposed to an external organic secretion, was there struck what we recognise as a truly modern note in all these speculations. So Brown-Séquard, among others, became imbued with the idea (1856) to which he tenaciously adhered throughout his long life, that each cell secretes on its own account certain products or special ferments which influence all other cells of the body by a mechanism other than the nervous system. From this conception, that something in the nature of an internal secretion is taken up from every tissue by the venous blood, the way was blazed for Bayliss and Starling whose chemical messengers or hormones (1902) have given a new impetus to the experimental studies of the ductless glands, brought back animal extracts into the pharmacopœia, and provided us with a wholly new kind of humoral pathology.

We have, to be sure, more hormones than Galen had humours, but they serve much the same speculative purpose. It was pituitary body of old that secreted the phlegm which was cold and humid and when predominant caused constitutional indolence or apathy. In Galenic terms we could well enough explain the placid temperament of a patient with a chromophobe adenoma as one who is dry and sluggish from retention of pituita in the phlegmatic glandule.

To one Galen in the second century there are uncountable inquisitors of biological phenomena in the twentieth, however Lilliputian their efforts may be in comparison. So it was inevitable that some searcher or re-researcher should again find signs of functional activity in this nigh forgotten gland. It came about, I should say, through Ludwig's invention of the kymographion, by which, on countless miles of smoked paper during experimental procedures, changes in blood pressure, among other things, have since been graphically traced. And when a pressor substance was thus shown by Schafer to be present (1894) in extracts of the pituitary body, albeit in its posterior portion alone (1898), here was indubitable evidence that the structure was at least not so vestigial as to be functionally extinct.

But this disclosure, important though it was, was not what first drew renewed attention to the neglected organ. Our knowledge of the processes of disease almost invariably starts with the description by someone of a clinical syndrome which others quickly recognise, and only then does the labour of running it down to its seat and cause really begin. So from clinicians such as Addison and Gull, and Graves and Basedow, and Marie, to mention but a few of them, came our first recognition of the group of maladies we have learned to associate with disorders of the ductless glands. And later when Lister had made it possible to extirpate with safety some of these organs that happened to be causing mechanical trouble through tumefaction, the symptomatic effects of glandular deprivation began to be made apparent.

Organs more readily accessible to attack were naturally enough those to be first subjected to this form of inadvertent surgical experimentation, and what part Kocher and Horsley and Halsted, all belonging to this College, I may add, came to play in forwarding our knowledge of goitre and in safeguarding its operative treatment I need scarcely recall. Nature gives up her secrets grudgingly

and in this instance she had virtually to be taken by the throat before the independent rôle played by Sandström's glandules was disclosed, for these inconspicuous bodies served to obscure the actual consequences of thyroid extirpations until Gley finally (1891) showed the reason why. All told, this practical conquest of goitre represents one of the most illuminating achievements of modern medicine, for out of it grew the belief that for each of the ductless glands we might some day expect to recognise a clinical syndrome due to oversecretion and an opposing syndrome due to insufficiency for which treatment by substitution might offer promise of cure.

Thus a conjecture long held by many was crystallised into the conviction that has given birth to the new and special subject of endocrinology which is sweeping aside many of our established views of disease in a tidal wave as destructive as that which swept over medicine at the end of the last century upon the discovery of the bacterial origin of the infectious diseases.

The Anterior-Pituitary Syndromes.

In Volume VII. of Murray's "New English Dictionary on Historical Principles" issued in 1909, the pituitary gland is thus defined: "a small bilobed body of unknown function attached to the infundibulum at the base of the brain; originally supposed to secrete the mucus of the nose." Since learned men were consulted in the preparation of this great lexicon it may be gathered that our knowledge of the activities of the structure in question has been gleaned in the past two decades. But some 20 years before that, what served first to reawaken interest in the region encircled by the Willisian vessels was the ultimate disclosure that the strange malady, which Marie had picturesquely but inadequately named acromegaly, was usually accompanied by an hypophysial tumour. What is more, pathological gigantism was soon recognised as a corresponding condition which differed merely in that it began at an earlier stage of life. One can imagine how excited John Hunter would have been at this discovery could it have come in his day and generation. His employment of madder-feeding (1756) in studying the growth of bone may be recalled—a method recently revived (1930) by Handelsman and Gordon in estimating the response of osseous tissues to the pituitary hormone of growth. Indeed, had not Hunter's passion as a collector of specimens momentarily exceeded his thirst for knowledge when he came to prepare the skeleton of the Irish Giant, he could scarcely have overlooked the hypertrophic gland with its enlarged fossa, the presence of which was not detected until Arthur Keith's inquisitive finger was put into it more than a century later.

So it was the tumefied gland that finally betrayed the organic locus of Marie's disorder, and this tumour, in some inexplicable way, was evidently associated with a tendency to hypertrophic changes in the skeleton. But we were far from being as yet on solid ground even in regard to this single and striking factor of growth. Though the difficulties of solving the problem seemed nigh insurmountable, they one by one have been largely overcome by the disclosures with which all are now familiar. It was first learned that extirpation of the gland in young animals checks their growth, a negative indication that acromegaly must be due to glandular overaction rather than to diminished or faulty activity. It meanwhile had become clear from occasional post-mortem studies that the tumour in acromegaly was an adenoma, and the more recent examination of surgical specimens has taught us that it is invariably composed of the acidophilic elements of the anterior hypophysis. And finally came the crowning achievement by Evans and Long who in 1921 produced experimental gigantism in the rat by repeated parenteral injections of saline emulsions of fresh bovine anterior lobe tissue.

All this seems simple in the telling. Results get recorded, not the slow and painful process beset with discouragements by which they are attained. One of the chief sources of confusion lay in the disconcerting fact that, after Rontgen's discovery had laid bare the silhouette of the skull to our direct inspection, many patients with outspoken acromegaly were found to have an unenlarged pituitary fossa; and still more surprising, it was soon found that a tumour-expanded sella without signs of acromegaly was far more common than with it. Out of this it slowly dawned upon clinicians that pituitary tumours of the latter kind had an accompanying symptomatology, once it was pointed out, as characteristic and definitely recognisable as that of acromegaly.

Attention was first drawn to this peculiar combination of symptoms by ophthalmologists and by gynæcologists. Women with unaccountable amenorrhœa not infrequently complained of disturbances of sight, and when their eyes came to be examined indications of pressure against the optic chiasm were often disclosed. Then, as time went on, cases of this sort began routinely to be subjected to rontgenological studies, and the expanded pituitary fossa with which we are now familiar was the usual finding. But these conditions were not limited to women. Men were as likely to be similarly afflicted, and though in the male there is no periodicity of function to be so strikingly interrupted, it was nevertheless clear that entirely comparable disturbances in the attributes of sex were present in them as well.

How the surgeon has come to be drawn into all this is simply explained. The problem at the beginning was purely a mechanical one, similar to that which led to the first operations for goitre. When the enlarged thyroid so compressed the trachea as to produce dyspnœa, surgical intervention was called for, whatsoever the hazard; the pituitary "goitre" similarly affected the optic chiasm by pressure, and unless this was relieved blindness might ensue. And so when ways of operating upon these more common hypophysial tumours came to be devised and surgeons with increasing confidence began to attack them and to provide tissues for study, they were found to be adenomas of an altogether different kind from those which accompany acromegaly.

THE ADENOMAS IN GENERAL.

Experimentation is by no means confined to the laboratory. The putting of ideas to the test with the elimination of error by trial is also necessarily the practice of the clinic. This is well exemplified in the case of the adenomas of the secretory organs, once regarded merely as curiosities of morbid anatomy but now shown to be functionally active conglomerations of cells which may disastrously upset the physiochemical balance of the body. Through their hypersecretory effects, they lead to recognisable states the contrary of those expressions of glandular inactivity seen in myxœdema, tetany, diabetes mellitus, or Addisonism. One after another they are coming to be recognised. The relation of the thyroid adenomas to hyperthyroidism was first brought to our attention. Then came the knowledge that the adenoma of acromegaly caused its effects by an excess of a normal secretion rather than by some abnormal secretory

product as had been surmised. In its turn the association of hypertension with suprarenal tumours, particularly those composed of chromaffin cells, began to be looked upon as the symptomatic verso of Addison's disease.[1] Then the syndrome of hyperparathyroidism (osteomalacia with muscular hypotonia, multiple bone tumours, and abnormal excretion of calcium) due to a predictable adenoma of one of the parathyroid glandules was in its turn disclosed.[2] And on the heels of this discovery the conjecture that certain clinical states, which bear a symptomatic resemblance to the effects of overdosage with insulin, might be due to an adenomatous hypersecretion of the pancreatic islets has become an established fact—at the time of this writing in my own clinic an exploratory operation on a patient with recurrent attacks of hypoglycæmia has revealed a small removable pancreatic adenoma composed of islet tissue.[3] And to these known hypersecretory syndromes may now be added that caused by a basophilic pituitary adenoma, the consideration of which must, for the moment, be deferred.

How much more of this lies ahead of us may easily be imagined, and were it merely a question of recognising one after another the clinical syndromes produced by the adenomas of each particular gland, we might expect to advance with unfaltering step. But there are pitfalls in the way, and one of them is functional interdependence of these glands.[4]

THREE HYPOPHYSIAL ADENOMAS IN PARTICULAR.

That the histological structure of the anterior hypophysis is complex I need scarcely recall. There are three types of cells easily distinguishable by their differing affinity for dyes. One type, of whose function we know next to nothing, has a feebly staining non-granular protoplasm called neutrophilic or chromophobe. The other two types, of which far more is known, are characterised by a coarsely granular and chromophilic protoplasm, the granules of the one being acidophilic and of the other basophilic. These tinctorially distinguishable cells are distributed somewhat indiscriminately throughout the gland, and cytologists have been at a loss to know whether they merely represent differing stages of activity of one and the same cell, or whether they have gained morphological and functional independence. It is safe to assume that they have.

As already mentioned, there are two well-known varieties of pituitary adenoma, chromophile and chromophobe, each having its distinctive constitutional manifestations as something wholly apart from the local or pressure effects of the tumour itself—the so-called neighbourhood symptoms which chiefly call for surgical intervention. The early experimental ablations of the anterior hypophysis in adult animals (1909) taught us that a state would ensue which was wholly comparable to that accompanying the chromophobe adenomas in man, and which therefore must represent a deprivation syndrome (hypopituitarism) as opposed to the syndrome of acromegaly (hyperpituitarism). All this was in correspondence with what had been long established regarding the thyroid, and though as a working hypothesis it served a useful purpose for some years, it now proves, in one important respect, to be quite inadequate. A striking feature of the deprivation syndrome, whether observed clinically or produced experimentally, was, as we have seen, a sexual dystrophy accompanied by demonstrable regressive changes in the reproductive apparatus. That a corresponding change in the organs of sex was known to accompany the supposedly counterposed states represented by gigantism and advanced acromegaly was difficult to reconcile with the assumption that these states were a consequence of secretory over-activity pure and simple. Some unknown but predictable element governing the functions of sex was unquestionably present. This element has been disclosed.

Its discovery was primarily the outcome of Stockard's observation (1917) that in the guinea-pig ovulation could be foretold by a periodic change in the cellular character of scrapings from the vaginal mucous membrane. On testing this out in the rat, H. B. Evans discovered (1921) the existence in these animals of a clock-like four-day ovulatory mechanism; and in the effort to modify this cycle by the injection of various ductless gland preparations, he found that the emulsion of fresh anterior pituitary substance served not only promptly to interrupt œstrus but, when long continued, to cause the pathological overgrowth to which reference has already been made. When, however, the female rats in which the experimental gigantism had been produced came to be sacrificed, their ovaries were found to be greatly enlarged by an excessive and precocious luteinisation of unruptured follicles within which the ova were imprisoned, thus accounting for the interruption of œstrus. This process, as it happens, is not what leads to the amenorrhœa of acromegalic women, nor was any corresponding follicular luteinisation observed by Putnam, Benedict, and Teel (1929) in their dogs with experimental acromegaly; but the observation nevertheless gave a possible explanation for the seeming inconsistency that both hyper- and hypo-pituitary states served to inhibit the ovarian cycle.

Meanwhile, in working on the deprivation syndrome in rats, P. E. Smith showed, to make the long story short, first that the dystrophic genital apparatus could be reactivated by the repeated reimplantation of fresh anterior lobe substance, and also that these effects were more prompt and striking when that portion of the bovine gland particularly rich in basophilic elements was used for the purpose. What is more, it was learned that after castration the anterior hypophysis becomes more or less engorged with basophilic elements and that pituitary glands so modified are particularly effective in restoring experimentally produced sexual dystrophy; and soon it was discovered that precocious maturity could be induced in infant rats and mice by implantation of hypophysial tissue or by the injection of glandular extracts containing the sex principle alone.

At the time of Evans's early experiments, in which an emulsion of the fresh anterior lobe was used, the presence of two hormones was not yet suspected, but the successful separation from the gland of the two substances in active form has since been accomplished, the problem of isolating the sex substance having recently been greatly simplified by Zondek and Aschheim's happy discovery (1928) of its presence

[1] Cf. Oppenheimer, B. S., and Fishberg, A. M.: Arch. Int. Med., 1924, xxxiv., 631. C. H. Mayo has reported a case of paroxysmal hypertension associated with a tumour of this sort which was predicted and removed at operation, Jour. Amer. Med. Assoc., 1927, lxxxix., 1047.

[2] Cf. General reviews of the subject by R. M. Wilder in Endocrinology, 1929, xiii., 231; and by Donald Hunter in Proc. Roy. Soc. Med., 1929, xiii., 27, and in Goulstonian Lectures, 1930, THE LANCET, April 26th, May 3rd, and May 10th.

[3] An equally clean-cut case, likewise with disappearance of symptoms after surgical removal of the adenoma, has been reported by Howland, Campbell, Maltby, and Robinson, Jour. Amer. Med. Assoc., 1929, xciii., 674.

[4] In reviewing this paper the writer is conscious of having drawn over much on the writings of his fellow countrymen. This is from no chauvinistic spirit but merely because the literature of the subject has become so vast, much of it must be taken second-hand.

in the blood and urine during pregnancy. There is much more about these later-day revelations than space can be given to recount. For my present purposes it must suffice to say that the existence of these two chemically separable principles in the anterior hypophysis obliges us to abandon, or at least to modify, the simple conception of hyper- and hypo-pituitary states as based supposedly on the effects of a growth principle alone.

Clinicians for many years have been puzzled by a peculiar syndrome (improperly called polyglandular, for all pituitary syndromes are essentially polyglandular) characterised by an exaggeration of the secondary characters of sex. That this disorder might possibly be laid at the door of the basophilic elements of the anterior pituitary was a natural assumption in view of the disclosures regarding the probable relation of these cells to the sex hormone in question. It is the prepared mind that knows what to look for, and at the autopsy on a victim of this disorder, who had died from an intercurrent infection, Dr. Teel has had the good fortune to find a small but unmistakable basophilic adenoma associated with hypertrophic changes in the ovary. It is a discovery which promises to clarify much that has heretofore been nebulous. Basophilic adenomas have been previously described, but Teel's, so far as I am aware, is the only recorded instance of a lesion of this type that has been predicted on symptomatic grounds and subsequently verified.

This independent rôle of the basophilic cells provides an explanation for the apparent symptomatic inconsistencies between the hyperpituitary syndrome of acromegaly and the opposed hypopituitary state produced by adenomas of chromophobe type in so far as both are prone to cause comparable dystrophic alterations in the organs of sex, particularly noticeable as amenorrhœa in women. The idea that the discrepancy might be ascribed to the tumour irrespective of its peculiar secretory character was the outcome of a recent study of the results of operations for suprasellar lesions that provoke what is known as a chiasmal syndrome with little or no enlargement of the pituitary fossa. Tumours of various kinds will produce this combination of symptoms, some of them being hypophysial adenomas of chromophobe type in which no secondary constitutional evidences of the lesion such as amenorrhœa were present. In other words, the normal function of the anterior hypophysis remains unaffected under these circumstances, whereas should a growing adenoma of the same type be confined within the sella, amenorrhœa will invariably appear as its first symptom.

Further to illumine this matter, the records of our entire series of verified adenomas has been reviewed by Mr. William R. Henderson, and it has been found to be generally true that whether the tumour were chromophilic in association with acromegaly or of the chromophobe variety, it was only when the pituitary fossa had become greatly expanded by intrasellar pressure that definite interruption of the functions of sex were certain to occur. Hence it may be assumed that the secretory activity of the basophilic cells, which have to do with the reproductive activities, has become inhibited purely by the effect of pressure; and, in further support of this, the fact may be mentioned that in favourable cases after partial surgical extirpation either of a chromophobe or an acidophilic adenoma in women normal menstruation may be resumed and childbearing occur.

All this, of course, applies no less to men who are afflicted with these processes than to women, and the general principle whereby an hypophysial adenoma of a given cellular type may so squeeze the cells of all other types against the relatively unyielding sellar envelopes as to render them inert, is particularly well shown by the symptomatic consequences of a chromophobe adenoma that has happened to occur in childhood. For then both acidophilic and basophilic cells are thrown out of action sufficiently early to cause cessation of growth and failure of maturation. The highly compressed residue of the gland may sometimes be histologically identified at the periphery of one of these expanding tumours.

Thus we begin to understand somewhat more clearly the nature of these anterior hypophysial tumours, whose symptomatology depends, to state the matter concisely: (1) on the elaboration of a growth inciting hormone in the absence of which dwarfism occurs; (2) on the elaboration of a gonadal stimulating hormone without which the normal maturation of the ovarian follicle cannot occur; and (3) on the presumptive elaboration of still another hormone (as yet unproved) that governs the normal function of thyroid, parathyroid, and adrenal cortex. To be sure, there is much still to learn, for the function of the cells comprising the chromophobe tumours remains unknown, but even so a distinctly forward step has recently been taken, which brings the pituitary body again to the fore after a period of doubt raised by those who were led to ascribe most if not all of its presumed functions to an independent hypothalamic source.

Tumours Affecting Neurohypophysial Mechanisms.

In the foregoing consideration of the pituitary adenomas and their symptomatology, nothing has been said, as will be observed, of that part of the dual structure in whose extracts a functionally active substance had first been detected. Indeed, by the time the sella turcica has become widely distended by a large adenoma, the posterior lobe will have disappeared without recognisable trace. Hence, from the clinical evidence furnished by the tumours of this type alone, taken in conjunction with the negligible effect of experimental ablation of the posterior lobe, it would appear that, if there is actually anything vestigial about the pituitary body as a whole, it is this very portion which first excited physiological interest.

Meanwhile, however, an hypophysial tumour of quite another type, which often begins seriously to affect the normal activity of the gland in pre-adolescence, had come to be studied with the unfolding of quite a different clinical story. Nearly a century ago (1838) Rathke had taught us how an epithelial invagination from the primitive pharynx meets the infundibular outpocketing from the base of the cerebral vesicle to form the dual gland. Naturally enough in this complicated formation with the subsequent obliteration of the craniopharyngeal duct epithelial "rests" may get sidetracked, and lead later on to anomalous tumefactions. On this basis we account for the variously named parahypophysial tumours of congenital origin which, for want of an inclusive term, may conveniently be called craniopharyngiomas.

Now these congenital tumours, which are surprisingly common, differ greatly in situation, size, and behaviour. They may be wholly intrasellar or wholly suprasellar. They may produce symptoms in pre-adolescence, or symptoms may be delayed until late in life. They vary in size from small, pea-sized cysts to huge, multilocular cystic lesions or to solid, calcareous masses as large as a tennis ball. One

thing, however, they share in common, a capacity to damage by compression one or more of the neighbouring structures, anterior hypophysis, posterior hypophysis, pituitary stalk, tuber cinereum, chiasm, and hypothalamus. Depending, therefore, upon the tumour's precise point of origin as well as upon the age at which its pressure effects begin to manifest themselves, there may be produced the greatest possible variety of local and constitutional symptoms, many of which are largely foreign to the adenomatous lesions which, up to this point, have alone been under consideration. Notable among these new symptoms are polyuria and adiposity in varied combinations with impaired growth and sexual dystrophy.

HYPOTHALAMUS V. HYPOPHYSIS.

It has been said that if some unusual clinical condition turns up concerning which one seeks information, an account of it is likely to be found in Jonathan Hutchinson's Archives. To this I would like to add, particularly for the benefit of neurologists, that if Hutchinson fails them, try Byrom Bramwell. In his much neglected book on intracranial tumours published in May of 1888, only two years after Marie's description of acromegaly, it is stated:

> "Tumours of the pituitary body are in many instances attended with an excessive development of the subcutaneous fat, and in some cases with the presence of sugar in the urine, or with simple polyuria (diabetes insipidus). Whether these symptoms are due to the fact that the pituitary body itself is diseased, or whether, as seems more likely, to the secondary results which tumours in this situation produce in the surrounding cerebral tissue, has not yet been decided. Possibly, as Rosenthal has suggested, the diabetes, which is sometimes present, may be the result of secondary changes produced in the grey matter of the floor of the fourth ventricle. He supposes that the pressure of the tumour first produces irritation of the grey matter lining the third ventricle, and that this irritation travels along the grey matter which connects the third and fourth ventricles and produces secondary changes in the latter."

Medicine was not yet prepared to grasp the significance of this truly prophetic statement; indeed, at the time it was written it was not as yet known with certainty that the malady of Marie had any relation to the pituitary body and, clinically speaking, the "grey matter lining the third ventricle" was undiscovered country. Thirteen years elapsed before Alfred Fröhlich's description of one of these cases was published as an example of "hypophysial tumour without acromegaly," which shows how confused were the ideas of pituitary function in those days of the widely discussed syndrome of adiposo-genital dystrophy. Much still remains obscure, but one can at least now clearly see that the skeletal and sexual infantilism which accompanies such of these tumours as begin to cause symptoms in childhood is due to compression of the anterior hypophysis with consequent inactivation of the acidophilic and basophilic elements that provide, as we have seen, the hormones of growth and sex. The dwarfism and sexual dystrophy which often accompany these tumours thus become easily explained, and the same is true of the visual disturbances common to all tumours of this region that press against the chiasm; but when we come to the other manifestations of these hypophysial-duct tumours, we find ourselves on less secure ground.

The detailed post-mortem study of one of these lesions found in the body of an adult adipose dwarf led Erdheim (1916) to express the view that adiposo-genital dystrophy is nothing more than pituitary dwarfism *plus* adiposity, the latter feature of the syndrome being ascribable to an involvement of the base of the brain—*adipositas cerebralis*. Thus nearly 30 years after Bramwell's statement, attention was again drawn to the possible participation of the hypothalamus in the symptomatology of pituitary lesions. And when this revived conjecture came to be followed a few years later by the disclosure at the hands of Camus and Roussy (1920) and of Bailey and Bremer (1921) not only that an experimental polyuria can be produced by injuries restricted to the tuber cinereum but that adiposity, sexual dystrophy, and as Roussy believed even dwarfism as well, might sometimes ensue, our accepted views of the relation of these symptoms to the pituitary body itself were badly shaken. One or another of these authors, independently, have gone so far as to express doubts as to whether loss of the hypophysis played any part whatsoever in the hypopituitary effects previously ascribed to it—a challenge which produced a veritable bouleversement of our cherished preconceptions.

Because of these disclosures, most of the earlier experimental hypophysectomies on dogs now unquestionably lie open to the just criticism first raised by Aschner (1912) that a coincidental damage of the adjacent tuberal nerve centres probably accounted for the post-operative polyurias, glycosurias, as well as the more tardy adiposity and genital atrophy that not infrequently supervened. Whether the canine gland was approached from below through the pharynx or from the side by elevating the temporal lobe, these secondary symptoms were apt to ensue. In the rat, however, as in man, the gland is overlain by a dural diaphragm merely perforated for the passage of the stalk, so that either the nervous tissues and pars tuberalis above or the body of the gland below can be separately subjected to experimental lesions. Taking advantage of this fact, P. E. Smith, after devising a parapharyngeal method of exposing the gland in these animals, has shown [5] that a sub-diaphragmatic hypophysectomy only leads to those inhibitions of growth and of sexual activity with which we are now familiar; when, on the other hand, the tuber is injured by a supradiaphragmatic injury, an adiposity, which at times is truly astounding, may be produced with little if any secondary effect on the functions of growth and sex. Though Smith has made no mention as yet of polyuria in his highly important series of papers, this want has just been supplied by Richter,[6] who, by an accurately placed stab-wound through the base of the rat's skull just anterior to the hypophysis, has produced a persistent polyuria in a series of animals (a ten-fold increase in one instance) in the absence of any ensuing adiposity. By these experiments a strictly hypothalamic syndrome as opposed to a strictly pituitary one has seemingly therefore been produced, there being no apparent overlap in the symptoms.

In consequence of all this, the attention of neuro-anatomists, pathologists, physiologists, and psychiatrists who share an interest in the nervous system has come of late years to be riveted on that much neglected portion of the palæo-cerebrum which lies, roughly speaking, within the bounds of the Willisian circle. In the walls of the third ventricle, with its dependent infundibulum and tuber, various clusters of nerve-cells have been described with complicated tracts running between them. It has come to be appreciated, meanwhile, that these centres are particularly vulnerable to the effects of encephalitis after which diabetes insipidus, obesity, somnolence, and so on are frequently observed. What is more, experimental hypothalamic injuries, other than those confined to the

[5] Smith, P. E.: Hypophysectomy and a Replacement Therapy in the Rat, Amer. Jour. Anat., 1930, xlv., 205.
[6] Richter, C.: Experimental Diabetes Insipidus, Brain, 1930, liii., 76.

tuber, which so markedly disturb the water balance and fat deposition, have disclosed in the anatomically insignificant 'tween-brain hitherto unsuspected activities, vegetative and emotional, of utmost functional consequence, the separate consideration of which must for the moment be postponed.

The Posterior Hypophysis.

It will be seen from what has gone before that, during the past decade, attention on the one hand, with great profit, has come to be focused on the anterior hypophysis which proves to be the "moderator" of the endocrine series, and that, no less profitably, attention has been drawn in the other direction to the fundamentally significant area at the base of the brain known as the diencephalon. The posterior lobe, meanwhile, has lain unattended in the shadow between these two fires, though there are abundant reasons, other than the known activity of its extracts, for lifting it from its obscurity. Certain of these reasons, both developmental and histological, may be mentioned.

That portion of Rathke's pouch which comes in contact with and ultimately envelopes the down-growth of nervous tissue comprising tuber and pars nervosa acquires epithelial characteristics quite different from those of the highly vascularised pars anterior. Indeed, this contact is essential for the normal development of the gland, as has been shown by the non-appearance of the infundibular protrusion in the tadpole when the epithelial component of the future gland has been cleanly removed, and by its normal development if a mere epithelial fragment is left behind; and what is more, as recently shown by Blount,[7] the epithelial rudiment of the gland when transplanted in amphibian embryos fails to develop unless some of the nervous tissue is taken with it.

Histological evidences of activity are based on the presence of a demonstrable secretory product and on the presence of non-myelinated nerve-fibres. In the fully formed adult gland under certain experimental or pathological conditions, one may see viable pars intermedia cells streaming into the posterior lobe in great numbers. Even under normal circumstances, as first described by Herring (1908), the epithelial cells of the pars intermedia appear to invade the pars nervosa becoming transformed into hyaline bodies which stream upward toward the ventricle between what appear to be loosely textured, long-drawn-out tails of ependymal glia. It has been shown, moreover, that if the hypophysial stalk is mechanically obstructed, the secretory product becomes dammed back in the lobe which becomes turgid with hyaline. There is strong evidence, therefore, to indicate that these Herring bodies represent the secretory principle which acts either directly on the nervous centres of the tuber, as some assume, or actually passes between the ependymal cells into the infundibular cavity as others have believed. As a matter of fact, under either assumption it might well enough affect the nerve centres, one of the more important of which lies directly under the ependyma, and evidence will be presented to show that posterior lobe extracts are far more potent when injected into the cerebral ventricles than by any other method of administration.

When studied by ordinary methods of fixation and staining, the posterior lobe has a nondescript appearance. The hyaline is usually dissolved out of its channels, and some chemical property in the lobe apparently counteracts the usual effect of the special stains for which glia and nerve-fibres elsewhere show marked affinity. When successfully stained, however, non-myelinated nerve-fibres [8] in abundance, as first clearly demonstrated by Greving [9] and by Pines,[10] can be traced from both the supraoptic and paraventricular nuclei (though more particularly from the former) to converge at the infundibulum, whence in a compact bundle they pass down the pituitary stalk to enter the posterior lobe. Arrived there, they not only ramify widely throughout the pars nervosa weaving themselves, as Greving states, in "basket-like" fashion around what appear to be secretory islands, but they also, according to Pines, can be traced in among the epithelial cells of the pars intermedia. With this the recent observations by Croll [11] and unpublished studies from my own laboratory are in full agreement. Nor, in my opinion, has due consideration in interpreting the effects of these tuberal injuries been laid on the fact that they are likely to interfere with the blood-supply to the gland, a certain amount of cerebral necrosis in the pars anterior being the usual consequence of stalk separation.[13] What is more, experimental evidence is accumulating which speaks in favour of the view that the epithelial investment of the infundibular lobe, whether as pars intermedia or pars tuberalis, has essentially the same function. In one or all of these three factors—nerve-supply, blood-supply and epithelial cuff of tuber—lies the probable explanation of much that has been contradictory in regard to the effects of experimental hypophysectomy as opposed to injuries of the tuber, more particularly in the dog, but probably in the rat as well.

This intermediary neuro-epithelial structure, therefore, cannot be lightly pushed aside in our temporary excitement over the diencephalon and its newly disclosed functional importance. Whether the several known responses to the injection of its extract are due to a single chemical substance or to more than one, is less important than the knowledge that striking physiological effects ensue—*hæmodynamic, antidiuretic, and oxytocic*—to which *pigmentary, galactagogue, antipyretic*, and *sudorific* effects may possibly be added. Let us, in the order of their discovery, take up these known responses and see what can be learned in behalf of this symptomatically neglected portion of the gland.

THE BLOOD-PRESSURE-RAISING EFFECTS.

Whereas in all studies of adrenal function the hæmodynamic properties of its extracts overtop all else, the comparable effects produced by an extract of the posterior hypophysis have been entirely lost sight of. Had not physiologists so conclusively shown that the rise in blood pressure which accompanies emotional states was associated with an increase

[7] Proc. Nat. Acad. Sci. (Washington), 1930, xvi., 222.

[8] In our experience they are best shown by De Castro's method, but the tissue must be removed and fixed at the earliest possible moment after death.

[9] Greving, R.: Klin. Woch., 1925, iv., 2181; also Deut. Zeit. f. Nervenheilk., 1926, lxxxix., 179.

[10] Pines, I. L.: Zeit. f. d. ges. Neurol. u. Psychiat., 1925, c., 123.

[11] Croll, M. M.[12]: Jour. Physiol., 1928, lxvi., 316.

[13] This abundant nerve-supply from interbrain to gland was unknown to the "hypothalamists" whose revolutionary papers appeared chiefly from 1920 to 1922, but there nevertheless lay before them the inescapable fact that extracts of the posterior lobe could check the more immediate and striking of the symptoms their tuberal injuries provoked.

[13] Dandy and Geotsch, at the writer's suggestion some years ago (Amer. Jour. Anat., 1911, ii., 137), described merely the chief source of the arterial supply to the canine gland. There has been great need of further and more detailed studies of the entire circulatory apparatus; and this want, I am permitted to state, has been filled by Pota and Flemming whose paper entitled A Portal Circulation from the Pituitary to the Hypothalamic Region will shortly appear in the Journal of Anatomy.

of adrenalin in the blood, one might have expected that between the two, posterior hypophysis and adrenal, the pressor response would more likely be due to a discharge of its active principle from the former which is near at hand, while the pathway to the adrenal is devious and long. In favour of this would be the recent knowledge that among other uncontrolled reactions, emotional explosions with an accompanying rise in blood pressure occur in an animal whose cortical inhibitions have been removed by severing the nervous pathways that pass from the frontal cortex to hypothalamus. The matter, indeed, might well be worth looking into as a possible cause of emotional hypertension, most other likely sources of information to explain these states having been exhausted. A surgical clinic, however, has less to do with irritative or emotional processes than with destructive ones produced by tumours and these, apart from the functionally active adenomas I have mentioned, can only be expected to evoke symptoms due to loss of activity.

Most patients with craniopharyngiomas which have served to compress the pituitary stalk, as these tumours usually do, have an unaccountably low blood pressure. Even in adults, a systolic pressure in the 90's is common, and registrations of 85/60 in a patient of 21, of 60/50 in a patient of 23, and of 80/60 in a patient 30 years of age occur in the hospital series. Still more to the point is the fact that patients with large chromophobe adenomas, which remain confined within the sella and compress the posterior lobe but leave the hypothalamus unaffected, usually have a relatively low systolic blood pressure (below 100 in 11 per cent. and below 110 in 46 per cent. of the cases). Beyond this we have nothing much to go on. What is more, confession must be made that two out of our series of 243 patients with verified chromophobe adenomas had coincidental vascular hypertension.[14] In want of a satisfactory explanation of these exceptions to the general rule, it must be admitted that from a clinical point of view the posterior lobe has no such definite influence on blood pressure as the laboratory experiences with its extract would have led us to expect. It may be that the clinic had been misled, as it was in regard to the presumed diuretic effects of the extract, and the fact that when injected into the ventricle in man it may cause marked peripheral vaso-dilatation with a fall in pressure rather than a rise possibly points in this direction.

THE ANTIDIURETIC EFFECTS.

How it is that the polyurias produced by various tuberal lesions can be counteracted by the injection of posterior lobe extract remains unexplained by those who ascribe to the hypothalamus an independent rôle in the production of the phenomenon. Doubtless in all the experiments of years past, too much attention had been paid to the symptoms of thirst and polyuria and too little to symptoms the opposite of these, oliguria having been observed not infrequently as a sequel of our early (1908–10) canine hypophysectomies. It may be stated, however, that the large intrasellar adenomas which are almost certain to obliterate the posterior lobe are not accompanied by polyuria, unless in the process of removing one of them the ventricular wall adjacent to the chiasm should happen to be injured. This would speak strongly in favour of the independent hypothalamic origin of diabetes insipidus were it not for the abundant nerve-fibres that sweep around both sides of the chiasm and descend in the walls of the infundibulum to their destination in the posterior lobe.

Owing to a continued interest in the problem of how the active principle of this part of the gland gets into operation, some further experiments have been made by Dr. Maddock in the surgical laboratory at Harvard by the application of silver "clips" at various levels on the hypophysial stalk. That such an occlusion of the stalk leads to a damming back of the hyalinoid substance elaborated in the posterior lobe, first reported with Emil Goetsch (1910), was again alluded to in my Cameron Lectures (1925); but what is more pertinent to our present theme is that polyuria may be produced in this way without extravasation of blood or such widespread damage as the experimental punctures are likely to occasion. In one of Dr. Maddock's animals, an enduring polyuria, which at times averaged above five litres per diem, ensued and, in the absence of any tendency to adiposity or other recognisable symptoms, persisted until the animal was sacrificed nearly two years later.

Thus, in contrast to the temporary polyurias usually produced by canine hypothalamic punctures, this clip experiment led to a more permanent disorder fully comparable to clinical diabetes insipidus. In seeking an explanation for this, I incline to the view that in the puncture experiments some of the conducting paths rather than the actual nerve centres have been damaged,[15] whereas the clip not only served to interrupt the nerve impulses to the posterior lobe but at the same time mechanically obstructed its secretion, a combination of circumstances that obtain in those tumours of the region with which diabetes insipidus is so often associated.

All this admittedly leaves unexplained why a more marked temporary polyuria does not follow the simple removal of the canine posterior lobe unless we accept Trendelenburg's recently expressed views regarding the vicarious action of the residual pars tuberalis. Indeed, it is yet a matter of uncertainty as to whether polyuria after all is a paralytic or an irritative phenomenon, for though it is commonly assumed to be the former, the familiar emotional polyurias would suggest the latter. But the experimental evidence so far contains much that is contradictory, and not until it will be possible to evolve some method of first stimulating and then of destroying the definite cluster of nerve-cells (presumably the nucleus supraopticus) which govern the response can we begin to feel that we have touched bottom in this watery topic.

THE OXYTOCIC RESPONSE.

The discovery by Dale (1906) of the specific action of posterior lobe extracts on smooth muscle, more particularly noticeable on the musculature of the pregnant uterus, has led, as is well known, to their employment in cases of delayed parturition. It was the experience of all, in the earlier experimental hypophysectomies, that when they were undertaken on a pregnant animal, abortion was inevitable, presumably from the setting free of secretion, though it is not impossible, as Ashner believes, that the effect was due to a coincidental damage of the tuber. This could be easily determined by observing the effect of an isolated tuberal injury in the pregnant rat, but so far as I know such a test has not been made. It

[14] It should be pointed out that these hypopituitary states are usually accompanied by a greatly lowered basal metabolic rate to which the vascular hypotension might well enough be ascribed. Opposed to this assumption is the fact that the two patients with definite hypertension also had a low basal metabolic rate.

[15] In Richter's prolonged puncture-polyurias in the rat (loc. cit.), it may be assumed that the supraoptic nucleus was the site of the lesion.

has been shown, however, by P. E. Smith that after total hypophysectomy in the rat, which leaves the tuber untouched, the muscle-fibres of the uterus atrophy and lose their wave-like contractility, and the fact that the fibres can be restored to their normal state by hypophysial implantations serves to exclude the hypothalamus from any possible participation in this effect at least.

The peculiarity will not escape attention that the reproductive cycle, after the act of mating, is inaugurated by discharge of the pars anterior sex hormone which initiates the sequence of events that lead to ovulation, whereas, on the other hand, the posterior lobe secretion facilitates the termination of the cycle by expelling the fœtus, both processes in all probability being related to some primary neuro-glandular impulses.[16]

The extract also acts, though less strikingly, on the smooth muscle of other organs than the uterus—on that of the intestine, for example. It increases intestinal peristalsis and particularly when injected intravenously may have a prompt cathartic effect. On the other hand, patients with tumours which have destroyed the pars nervosa or thrown it out of function by compression are, in many instances, notably victimised by troublesome chronic constipation.

PIGMENTARY EFFECTS.

Although the standardised rat threatens to usurp the place once occupied by the frog as the principal contributor to physiological knowledge, the frog and its larvæ still have ample contributions to make. Not only has embryology taught us that the rudimentary hypophysis is the first of the future endocrine organs to be differentiated, but in the tadpole its exposed position lays it open to surgical removal. When so removed, as first shown (1916) independently and brilliantly both by Allen and by Smith, the growth of the tadpole is checked, metamorphosis does not occur, and the pigmentary system is so affected that the embryo acquires a silvery or albinous appearance owing to the contraction of the cutaneous melanophores. Reimplantation of the hypophysis or the parental injection of fresh pituitary emulsion serve to counteract all these effects; but of especial interest is the fact, of late strongly re-emphasised by Allen,[17] that transplants of the pars intermedia from adult frogs into these albinoid tadpoles, while without effect on growth or metamorphosis, serve within a few hours permanently to expand the melanophores with darkening of the skin. Here, then, is evidence of still another peculiar property of posterior lobe extracts which must be taken into consideration—their influence on the metabolism of dermal pigments.

It is curious that the principal pigmentary disorder which is clinically recognised is that associated with Addison's disease, the adrenal glands, as may again be recalled, being in a certain sense (the analogy cannot be pushed too far) a fused neural and epithelial structure somewhat akin to the pituitary body. Pituitary disorders, though less conspicuously so, are likewise accompanied by appreciable pigmentary disturbances, and, in passing, attention may be drawn to the reputed exemption of the negro to endocrine disorder of any kind. The complexion of an acromegalic, as is well known, noticeably darkens in colour, whereas the reverse is true of hypopituitary states in which the skin shows in addition to its other distinctive peculiarities a characteristic pallor. Presumably, from the inability of the body to elaborate melanin, the skin of these patients no longer pigments readily on exposure to the sun, and when it does so, the exposed parts are apt to be freckled rather than uniformly darkened. Whether this peculiarity of hypopituitary states would be overcome by the administration of posterior lobe extracts has, so far as I know, never been tested.

GALACTAGOGUE ACTION.

Posterior-lobe extracts were claimed by Ott and Scott (1910) to have the property of augmenting the quantity of milk in the lactating goat, and they have since gained repute as a means of increasing the diurnal yield of cows. Whether this property has any bearing on the extraordinary prolongation of the period of lactation which sometimes afflicts acromegalic women after childbearing seems most unlikely. Examples of continued lactation for as much as seven years has been recorded, and in one of my patients it has persisted for over five. It is reasonably certain that a hormone from some source incites the mammary changes that accompany lactation, but it is more probable that it is liberated from some pelvic organ modified by the chain of events accompanying pregnancy than that it should hark back to the pituitary body (far less its posterior lobe) which set these events going.

The possibility that posterior-lobe extract may exercise an hitherto unobserved *antipyretic effect* and also a *sudorific effect* has been suggested by the lowering of body temperature and by the profuse sweating that follows the injection of pituitrin directly into the ventricle. There will be occasion to return to this possibility later on.

(To be concluded.)

[16] Fontes (Compt. rend. Soc. de Biol., 1929, cii., 227) claims to have shown the presence of oxytocic properties in the blood at the time of labour.

[17] Allen, B. M.: Source of the Pigmentary Hormone in the Anterior Hypophysis, Proc. Soc. Exper. Biol., 1930, xxvii., 504.

ON THE VALUE OF RAMISECTION IN CASES OF SPASTIC WEAKNESS.

BY

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THE operation of ramisection, or division of the sympathetic rami to the limbs, was devised by J. I. Hunter and N. D. Royle in the course of some experimental observations upon muscle tone in animals. It was subsequently employed by Royle in the treatment of spastic weakness in human beings, on the assumption that the nervous impulses responsible for the hypertonus in such conditions are conveyed by the sympathetic efferents. Royal and others have reported a considerable number of successful results from the operation. On the other hand there have been adverse reports. The purpose of this communication is to record the observations made by several independent witnesses upon six cases in which the operation was performed by Royle himself while on a visit to this country in 1927.

The patients were selected by Royle from a number of children afflicted with spastic weakness of various kinds as being marked cases of spasticity likely to benefit from ramisection. The operations were performed by him during the months of May and June, 1927, at Queen Mary's Hospital, Carshalton. The

patients were throughout under the care of Mr. Gordon Pugh, who was responsible for the supervision of post-operative care, massage, and re-educative exercises, this being planned upon the lines advised by Mr. Royle. Both before and after operation these patients were seen by a number of orthopædic surgeons and one or two neurologists. Their post-operative condition was reviewed in June, 1928, by a group comprising Messrs. Bankart, Bristow, Elmslie, Fairbank, Verrall, Perkins, and Pugh; on this occasion all six patients were examined and their state compared with that recorded in the preoperative notes. In March, 1929, their history was again reviewed by Messrs. Bankart, Bristow, Fairbank, Laming Evans, Pugh, Trethowan, and Dr. Symonds. At this meeting three of the patients were examined; notes were made of their condition and compared with those made by Mr. Gordon Pugh and by others before operation. One had been unanimously considered unimproved at the meeting of June, 1928. Dr. Symonds was deputed to visit, examine, and report upon the two remaining patients.

Results in Six Cases.

The notes of these cases provide too large a mass of material for publication in extenso. They have been compiled in full, reviewed, and summarised as follows:

In *Case 1*, presenting a combined extra-pyramidal and pyramidal rigidity and weakness of left upper and lower limbs following encephalitis lethargica, cervical and lumbar ramisectomy resulted in an immediate post-operative reduction of rigidity with increased freedom of voluntary movement. Within a week of the operation the spasm of the arm was returning, though the leg was still improved. Thirteen months later the patient's condition was as before the operation and remains so at the present time.

In *Case 2*, presenting a bilateral rigidity and weakness of a purely extra-pyramidal type after encephalitis lethargica, double lumbar ramisectomy produced no improvement.

Case 3 was that of a boy presenting at the time of operation a left hemiplegia which had come on acutely six and a half months previously either as a result of a polio-encephalitis or as a manifestation of congenital syphilis. In this case left cervical and lumbar ramisection were followed by a slight, but definite, diminution of rigidity and increase of voluntary power. In the opinion of Dr. Symonds, however, the amount of improvement shown was such as might reasonably have been expected with re-educative treatment alone in a case of hemiplegia from vascular or inflammatory cause with a history of acute onset only six and a half months before. He considered, therefore, that the improvement which undoubtedly followed operation could *not* fairly be attributed to it.

In *Case 4*, a severe spastic quadriplegia, bilateral lumbar ramisectomy resulted in some quite temporary improvement.

Case 5 had been noted by Mr. Trethowan several months before ramisectomy was entertained as "not a very bad case" of spastic quadriplegia, able to walk with a little help. There is no evidence to show that bilateral lumbar ramisection in this case produced any result, such improvement as was ultimately seen being accounted for by the lengthening of the tendo Achillis on both sides which was subsequently performed.

In *Case 6* a right hemiplegia of old standing, cervical and lumbar ramisectomy were followed by temporary improvement, with subsequent return in the course of a few months to the preoperative state. A chance observation upon this patient illustrates the importance of continuous educative exercises, for during a period of six weeks, while these had to be discontinued, she relapsed into a condition worse than that noted since her admission.

Conclusions.

1. The operation of cervical or lumbar ramisection as performed by Mr Royle is without effect upon the rigidity from extra-pyramidal disease.

2. The rigidity of pyramidal disease as seen in conditions of hemiplegia or quadriplegia in children may be temporarily diminished after the operation. This temporary diminution of tone has been observed in both upper and lower limbs with some improvement of voluntary power. The diminution of tone and improvement of function are, however, short lived, and within a few weeks or months, notwithstanding continuous measures of re-eduction under experienced medical supervision, the condition of the patient remains as before the operation. In the opinion of several of the surgeons who examined these cases both before and shortly after operation, the diminution of tone was no more than may be seen after *any* major surgical procedure with post-operative shock.

3. The operation therefore appears to have no place of value in the treatment of spastic weakness.

4. The observations recorded show that in young human beings the sympathetic fibres play no rôle of any importance in the maintenance of muscular rigidity, whether this is of the so-called parkinsonian variety or of the type seen in lesions of the pyramidal tracts.

INTRAVENOUS PYELOGRAPHY.*

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THE discovery of cholecystography by Graham stimulated the search for an iodine-containing substance capable of being picked up out of the blood stream by the kidneys in a concentration of such intensity as to enable pyelograms, ureterograms, and cystograms to be taken. Roseno devised such a substance, consisting of sodium iodide joined to a urea molecule, named pyelognost. It has to be given in large doses and appears to be somewhat toxic, so that it has not been widely adopted for clinical application. It enabled Roseno to report some observations of considerable interest on the physiology of the ureter.

Prof. Arthur Binz, a pupil of Ehrlich, was working in Berlin on organic compounds of iodine, particularly selectan neutral. Prof. von Lichtenberg and one of his assistants, Dr. Swick, of New York, enlisted his help to try out on animals and later on human subjects a series of substances related to selectan-neutral. Prof. Binz provided them with a substance derived from selectan neutral belonging to the pyridine group which appeared to possess the properties for which they were seeking. To this substance they have given the name of uroselectan. It has an iodine-content of 42 per cent., and is readily dissolved in water, the solution being neutral. Swick found that 180 g. of the substance dissolved in water could be injected intravenously into a man weighing 60 kg. without danger of poisoning. He found that in persons with normal kidneys 15 minutes after the injection no more iodine could be recovered

* Being the substance of a lecture delivered before the Windsor and District Medical Society on May 29th.

from the blood stream, and that 90 per cent. to 95 per cent. of the substance could be recovered *unchanged* from the urine within eight hours. The iodine exists in the molecule in a very stable organically bound state. Iodine in large doses appears to be toxic only if injected in an inorganic ionised state. The substance seems to possess the peculiar property of passing through the renal tubules and out of the body in the urine without being changed in any way and without giving off any ionised iodine. This appears to be the explanation of why it does not give rise to iodism.

Use of Uroselectan.

For clinical purposes Swick and von Lichtenberg have been using 40 g. uroselectan dissolved in 100 c.cm. of distilled water. They used it in 119 cases with one death, a case of nephrosis that died of uræmia 19 hours after the injection. The injection is given *slowly* into a vein and radiograms are taken a quarter of an hour, three-quarters of an hour, and one and a quarter hours after the injection, and for even longer if necessary. If both kidneys are normal in function, within a few minutes the bladder is full of the substance and a clear picture of its outline is thrown on the X ray plate. At the same time the substance of the kidneys being full of the drug are rather densely outlined and dim shadows begin to appear of the pelvis and parts of the ureter. After half an hour to an hour the shadows of each pelvis and of the ureters may show up reasonably well, though usually not so distinctly as when filled from below by means of sodium iodide. In a little more than half of the cases the pictures are dense enough to enable a trained urologist to form an opinion as to the anatomical condition of one or both kidneys. If, on the other hand, one or both kidneys are deficient in function it may take many hours before the pelvis of the kidney fills up at all, particularly in cases of inflammation or tumour. Where, however, there is a one-sided obstruction to the ureter or an obstruction in the urethra more satisfactory pictures are obtained as the substance accumulates above the obstruction in a high concentration. The patient must micturate between each exposure as the bladder becomes opaque and obscures the lower ends of the ureters.

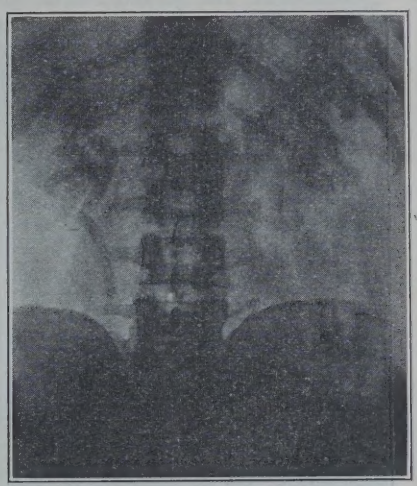
FIG. 1.

(Case 1.) Tuberculous left kidney; calcified obliterated left ureter.

By the courtesy of Prof. von Lichtenberg, to whom I extend my warmest thanks, I was presented with advance samples of uroselectan, and this enabled me to publish in the *British Journal of Urology* the first account in this country of the method, with a description of my first case which was injected on Dec. 18th, 1929.

The exact technique for preparing the substance for injection is furnished with each sample of the drug. Suffice it to say that the preparation has to be exact and should be carried out by chemists accustomed to the preparation of intravenous solutions. Each injection must be freshly prepared. The solution appears of a brown colour. This is not due to the presence of free or dissociated iodine, but is purely an optical effect due to the great weight of the molecule and is said to be typical of all pyridine compounds. The solution has been boiled continuously for three hours without the production of any free iodine. Mr. Ward, of the Crookes Laboratories, has examined a specimen for me. He states that its solution contains no free iodine even when boiled and kept at a temperature of 100° C. for one week, or when autoclaved at 120° C.

FIG. 2.



(Case 2.) Stone blocking the right lumbar ureter.

The drug cannot be given by the mouth as it is said to cause vomiting. As the injection is being given the patient may complain of a buzzing in the head, of a general feeling of warmth, and sometimes of thirst and slight giddiness. Some of the patients also complain of cramp in the arm which is being injected. Apart from these symptoms the injections in my hands have been free from unpleasant effects.

TOXICITY.

As yet, though the drug has been given in a considerable number of cases, no clinical evidence has appeared to suggest that the drug causes any damage to the tissues in general or to the kidneys in particular. It is true that death occurred within 24 hours after an injection in one of Swick's cases, but this happened when the drug was given to a patient already suffering from uræmia as a result of nephrosis. Experience suggests that the drug should not be used when both kidneys are known to be severely damaged. A careful clinical examination should usually suffice to exclude such cases, and probably it is a wise precaution to estimate the blood-urea in all doubtful cases before giving an injection. Heritage and Ogier Ward obtained a kidney at autopsy some little time after an injection, and the pathologist, Dr. Brewer, stated as a result of his examination that it indicated that the renal tissue had suffered no acute damage from the use of uroselectan. Prima facie it is difficult to believe that the delicate secreting cells of the kidneys are not physically damaged when they are asked to thrust such heavy molecules out of the blood stream into the urine in so short a space of time. Experiments on animals are being carried out to throw further light on this question. The evidence at present available with regard to toxicity justifies the use of uroselectan in chosen cases, but a further period must elapse before it is safe to say that it should be used freely for routine examinations.

Results.

I have used uroselectan in 17 carefully selected cases, that is to say, in cases where I thought it was likely to yield additional information of value, or in cases that had been cystoscoped by others previously and whose experiences led them to prefer a method which might enable them to avoid another cystoscopy. There were four cases of stone, four of hydronephrosis, one of renal tumour, three of tuberculosis, two of doubtful renal pain, and three of pyelitis. The answer given was satisfactory in 11 cases, doubtful in three cases, and of no value at all in the remaining three cases. In one case the answer was wrong. It was thought that a renal tumour was present; the kidney proved on removal to be full of multiple abscesses.

FIG. 3.

(Case 3.) Hydronephrosis right kidney; healthy left kidney.

Cases of stone and hydronephrosis yielded the best pictures, cases of tumour and pyelitis yielded poor pictures. One patient vomited while the drug was being given, but the condition of the others gave no cause for anxiety, and there were no unpleasant after-effects.

I have selected four of the best cases for illustration. One cannot expect to get such definite pictures in every case, and unless this is borne in mind an unduly favourable idea of the method will be gained.

CASE 1.—Female, aged 58 years. Many years intermittent pain in left loin. Tender swelling in left loin without bladder symptoms. The urine was clear, the left ureter was completely blocked, the bladder was healthy. Uroselectan revealed a large tuberculous sacculated kidney completely destroyed, with calcification of the left ureter.

CASE 2.—Male, aged 28 years. For a long time repeated attacks of violent right-sided colic. Doubtful shadow in region of right lumbar ureter. Cystoscoped elsewhere without diagnostic result. Unwilling to undergo further cystoscopy. Uroselectan showed that the shadow was a stone blocking the right ureter. The left kidney came out very poorly in this case. The stone had to be removed by operation as the patient refused to try cystoscopic removal.

CASE 3.—Male, aged 45 years. Four years right renal colic, hæmaturia, wasting. Refused cystoscopy. Uroselectan showed a healthy left kidney, a large hydronephrosis on the right side. Confirmed at operation.

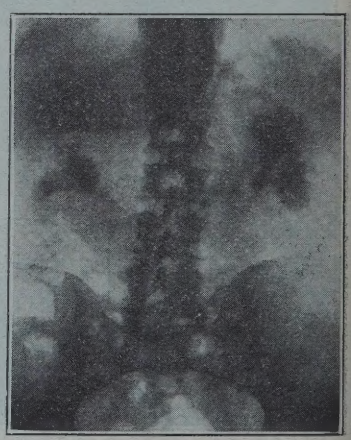
CASE 4.—Male, aged 60. Three years pain in left loin and hæmaturia. Large shadow in region of left kidney. Uroselectan showed a healthy right kidney, the left kidney pelvis blocked by a stone with more than half the kidney substance destroyed.

Kidneys the subject of severe infection, pyonephrosis, or advanced tumour appear to excrete uroselectan poorly and so may fail to yield a picture; whereas kidneys with back pressure, even if considerably destroyed, appear to show up better as the drug accumulates above the obstruction. Where both kidneys are subjected to back pressure we do not yet know if the drug is likely to prove toxic. The method should not therefore yet be employed as a routine method before cystoscopy, and will be needed less often in the case of women than of men. Suitable cases ought to be picked by men skilled in urology, otherwise mistakes are likely to arise and accidents to happen. Clinical signs of mild or threatening renal failure should be searched for, and in cases of doubt the blood-urea should be estimated. The urologist is in the best position to say in any given case as to whether cystoscopy is necessary or desirable before or after the use of uroselectan. There are many things that can be learnt by cystoscopy that cannot be revealed by intravenous pyelography, and that are essential for a complete diagnosis—for instance, the nature of a chronic cystitis or a tumour of the bladder.

When should the Method be Used?

Intravenous pyelography would have obvious advantages if it were proved to be entirely non-toxic, and if it gave satisfactory pictures in a fair proportion of cases. The discomfort associated with cystoscopy could sometimes be avoided, and the method seems to give indications of the functional power of each kidney, in addition to anatomical pictures of the urinary tract. At present, however, it should be reserved for use in difficult cases where cystoscopy and catheterisation of the ureter are difficult, dangerous, or impossible—e.g., where one ureter is so blocked by stone or stricture as to prevent the passage of opaque medium upwards into the kidney; in cases of very profuse hæmaturia; in severe cystitis; in certain cases of stricture of the urethra and enlarged prostate unassociated with chronic uræmia; in cases where one or both ureters open in abnormal positions after resection of the bladder, after implantation of the ureter into the bowel, in cases of ectopic ureter; in cases of vesical pouch to show the relation of the ureter to the pouch; in cases of ureters damaged at operation and the subject of fistulæ.

FIG. 4.



(Case 4.) Stone blocking the pelvis of the left kidney.

In most cases of hæmaturia the urologist would hesitate at the present moment not to employ cystoscopy. By this means he may at once detect a papilloma of the bladder, or he may be able to determine that the blood is coming from one ureter only. In such a case he would at once take an ordinary pyelogram of the bleeding kidney. To defer cystoscopy in such a case in the hope of obtaining complete information by intravenous pyelography would be unwise and hardly fair to the patient, especially when it is realised that renal tumours secrete the drug poorly if at all, give poor pictures, and are liable to be mistaken for inflamed kidneys.

Again, in the average case of tuberculous cystitis far more definite indications for operative interference

can be obtained by cystoscopy, and the intravenous method would only be used subsequently to confirm its results and possibly to throw some further light on the case. The results in tuberculosis were not decisive in two out of three cases.

In case of *Bacillus coli* cystitis in men, if the prostate has recently been acutely inflamed it is wise to defer cystoscopy. Intravenous pyelography may in such cases throw light on the state of the kidneys. But if one of the kidneys fails to excrete enough uroselectan to throw a shadow the only permissible conclusion is that that kidney is infected and only temporarily out of action. The finding does not necessarily mean that the kidney has been permanently damaged.

As a routine in cases of enlarged prostate and stricture of the urethra it is doubtful whether the method can be relied upon to give evidence valuable enough to justify the increased risk that its use entails in those particular cases. Where, however, one ureter is partially blocked by stone or other form of obstruction the conditions are ideal for getting the most out of the method with the least risk. It will undoubtedly prove of the utmost value in allowing us to study what happens to ureters after they have been resected and reimplanted either into the bladder itself or into the bowel. This is a question that has been crying out for solution for many years and it is likely now to be solved for all practical purposes.

FUNCTIONAL AND DYNAMIC TESTS.

1. It seems probable that the comparative *functional value of each kidney* can be estimated by observing the time and density of the appearance and disappearance of the X ray shadows. The quicker and more densely the shadow appears and the quicker it fades the better the kidney. If a kidney is slow to excrete the drug or if a shadow does not appear at all on one side this suggests more or less severe loss of function or even absence of the kidney. Inflammation and tumour formation delay or even prevent excretion. Back pressure delays but does not prevent excretion. In some cases the loss of function has been shown to be temporary, as for instance in cases of calculous anuria or of toxic or bacterial nephritis. A failure on a single occasion to observe a shadow should not lead to the conclusion that one kidney is completely destroyed or absent. The examination may have to be repeated.

2. The method can be used as a means of estimating the *power of both kidneys* together, either by precipitating the urine passed in a given time with strong acid and securing a measurable amount of dried uroselectan, or more simply by estimating the specific gravity of the urine passed every half hour after the injection. Normal kidneys seem to be able to excrete about three-fifths of the substance during the first two hours after injection and about another quarter in the next hour. After that, though some of the substance is still being excreted, it is not in a high enough concentration as to throw a shadow on the plate; 90 to 95 per cent. of the substance can be recovered from the urine unchanged in six to eight hours.

The specific gravity of the urine in the case of healthy kidneys may rise rapidly to about 1030 in an hour and even to as high as 1050 in less than two hours. Then it begins to sink rapidly again to its normal level. These rates of rise of the specific gravity can be compared with the density of the X ray shadows. Our experience so far has been that this rise in specific gravity is not always seen in some cases where the kidneys do not appear to be depressed in function. It is doubtful if this test is of universal application.

3. *Dynamic Tests.*—Roseno made some observations of interest on the tone of the muscle of the pelvis and ureter in cases of pyelitis of pregnancy, and in cases of stone in the ureter. For instance, his observations suggest that in cases of loss of tone forced drinking of fluid may lead to undesirable stretching of the ureter and may be a cause of renal pain. Observations similar to the method of pyeloscopy elaborated by Legueu are being carried out by von Lichtenberg, and it is hoped that they may lead to an even fuller knowledge of the dynamics of the ureter, since the ureter is not being disturbed or obstructed by the presence of a ureteric catheter. Now is not the time to speak further of these observations but it is highly probable that they will prove of importance.

Diagnosis and Treatment.

Owing to these dynamic alterations of the ureter the interpretations of the X ray pictures are often very difficult and mistakes are easily made. The pictures cannot be interpreted by the canons of ordinary urography. For instance, the musculature of the pelvis itself may be in spasm, in which case curious outlines appear that might at first sight suggest filling defects. At other times the musculature is in a state of temporary atony. If this appearance is mistaken for permanent atony operation may easily be advocated and carried out in cases where it is not needed. Again, the ureter often fails to show up in its entire length. In one picture the upper part of the ureter is seen, in another only the lower part. This simply means that a picture of a wave of normal peristalsis has been caught by the photograph. In other cases the ureter may appear to be dilated without physical obstruction, or it may be dilated in part only, or above or below an obstruction. The reading of the true meaning of this dilatation is difficult and varies with each case. In some the dilatation is a temporary atony. In others a permanent dilatation due to obstruction or inflammation. Each photograph can only be read by considering all the other features of the particular case. The biggest trap of all seems to be the difficulty of distinguishing between a tumour of the kidney and a kidney temporarily out of action from inflammation.

In the early days of bacteriology and biochemistry the true progress of clinical medicine received a check as enthusiastic observers attempted to make a so-called diagnosis by means of bacterial or chemical tests alone. The patient was apt to be forgotten and his interests suffered. The same thing is likely to happen in the first rush of enthusiasm to use uroselectan. Even if the drug is found to furnish anatomical and functional evidence of value in 50 to 70 per cent. of all cases examined, yet the facts so obtained will never be sufficient to yield a diagnosis in the true sense of the word. Such a diagnosis can best be made by men long trained in the clinical application of all the diagnostic methods available. Even more important than the diagnosis is the provision of sound advice as regards prognosis and treatment. Uroselectan will fail to be of benefit if this is forgotten.

CALCULI.

We may take as an example cases of stone. Even to-day few seem to be aware that in a large proportion of cases where a stone is detected by X ray examination *no operative interference is required.* At least 80 per cent. of ureteric stones can be removed by cystoscopic methods, and open operations for the

removal of these stones in the hands of urologists are seldom employed. Again, for reasons well known to the specialist, it is often highly undesirable to operate on patients with large bilateral renal calculi. The question of the need for removal of large unilateral stones or of smaller stones in one or both kidneys is one that requires long experience. It is surprising how many can be left alone with advantage to the patient. Even if operation is considered necessary, large issues depend on the type of operation employed whether it is to be pyelolithotomy or nephro-lithotomy or a combination of both, whether the kidney is to be drained and washed out afterwards, or whether the kidney is to be removed altogether. Unless such an operation is performed by a surgeon who has made a special study of the subject recurrence of the stone within a year is the common result, and the kidney is often very much damaged by the operation. As regards stones in the bladder, the common failure to make use of litholapaxy or of prostatectomy proves that often those who operate on these cases at the present day by means of cystotomy do not understand the first principles of the subject. There is no need to labour this aspect of the subject further. Suffice it to say that uroselectan is bound to help the urologist in carefully picked cases. It seems probable that better substances will shortly be discovered now that it is realised that excretion-urography is a practical proposition.

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INTRAVENOUS PYELOGRAPHY

AS A TEST OF RENAL FUNCTION.

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INTRAVENOUS urography fulfils a long-felt want, not only in revealing morphological changes, but in giving a clue to functional capacity. My brief experience leads me to think that the time of appearance rather than the density of the shadow is the real test of renal function. In all cases in which the drug has appeared in under half an hour Mr. R. Ogier Ward and I [1] have found a good deal of macroscopically normal renal tissue. The ability to excrete uroselectan, in sufficient quantity to be detected radiologically, seems to be retained although the organ may be working under difficulties, and in cases in which the pelvic shadow has been absent from all radiograms, and where we have had the opportunity of confirming our findings either at operation or autopsy, we have found the organ so completely disorganised as to be obviously functionless. In normal cases, and in any other cases where obstruction was absent, a difficulty has been that the radio-opaque urine is evacuated into the bladder as fast as it is excreted. Thus it is not unusual in a normal case to find, a quarter to half an hour after the injection, that the pelves and ureters are only very faintly outlined, whereas the shadow of the bladder fills the pelvis.

In most of these cases pyelography has been undertaken to exclude early renal disease, and while it is of value to know that the renal function is normal, and that there is no obstruction to emptying a satisfactory outline of the pelves *and calyces* must be obtained. It seems possible to overcome this difficulty by temporary compression of the ureters. We have noted that using the method of J. Ziegler and H. Köhler it was possible to obtain an outline of the renal pelvis after the administration of sodium iodide and urea by the mouth. The prolonged compression (the above workers recommend half an hour) is not without disadvantage and possible risk. It has been shown experimentally that prolonged ureteric obstruction makes a kidney more liable to blood-borne *Bacillus coli* infection. At first we attempted to obstruct the ureter by an occluded ureteric catheter. The urine, however, drained away alongside the instrument and no contrast filling was obtained. Using uroselectan, ureteric compression of a few moments, certainly not more than five minutes, was sufficient to outline the calyces in cases with no marked depression of function.

The routine recommended is to observe the time of appearance of the drug in the quarter and half-hour films; if a shadow has appeared by this time demonstrating satisfactory renal function, but the calyces fail to show although the bladder shadow shows well, compression is applied to the ureters at the level of the sacroiliac joints. The compression required is not great. A pad similar to that used for renal compression may be applied by a special arm attached to the X ray couch, or an inflatable rubber bag may be held in place by a webbing belt. In practice we have found the latter method quite sufficient.[2] Anything approaching anatomical occlusion of the ureteric lumen is not attained; merely a hindering of peristalsis is sufficient. In the very stout this method is useless, so it seems that cystoscopic pyelography must be added to the already considerable penalties of obesity. Even in patients of average build, a high standard of radiological technique is often required to show the faint half-shadow of a rapidly emptying normal renal pelvis and it is probable that on a poor film no shadow would be seen at all. In such, and also in cases with poor function, a brief compression of the ureter may serve for distinction from cases of absent or functionless kidney.

Intravenous pyelography is the complement of cystoscopy, but its use must be combined with and its results checked by, the older urological methods. The indiscriminate employment of uroselectan as a short-cut to urinary diagnosis cannot but be condemned.

[1] See Brit. Med. Jour., 1930, i., 734.

[2] Mr. Schranz of the Genito-Urinary Manufacturing Co., has made for me an abdominal belt incorporating an inflatable rubber bag for ureteric compression.

WEST OF SCOTLAND RADIUM CENTRE.—Early this year the Western Infirmary of Glasgow was selected as the national radium centre for the West of Scotland. It has now received its first consignment and the amount available is about one gramme. The national radium will be used only in the hospital, but no such restriction is attached to the radium purchased two years ago with £5000 given by Sir Henry and Lady Mechan. The Glasgow and West of Scotland Radium Committee at Glasgow University has for several years possessed 700 mg. which furnishes radium emanation for five of the principal hospitals of the city. In 1928 the Glasgow Royal Cancer Hospital increased its supply with £10,000 given for the purpose by Lady Constance Burrell.

TELLURIUM IN THE TREATMENT OF SYPHILIS.

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Levaditi,[1] alone and in collaboration, has investigated the value of tellurium in experimental rabbit syphilis and spirochætosis. Out of numerous preparations the best were a suspension of tellurium element in glucose and of tellurium oxide or tellurium iodo-quinine in oil. All three had a powerful prophylactic action. A dose of a fortieth to a tenth of a gramme per kilogramme body-weight, injected intramuscularly 8 to 27 days before inoculation of syphilitic material, would prevent a rabbit contracting the disease, and would continue to do so for something under 108 days in the case of the smaller dose and for over 116 days in the case of the larger dose. It was found that the tellurium in the tissues must reach a certain minimal quantity to prevent infection, the "potential métallique tissulaire" of Levaditi. Thus animals which had resisted infection with *Spirochæta pallida* up to 172 days after injection of tellurium showed at least 0·8 to 1·0 mg. of tellurium per gramme of dried renal substance on autopsy. The corresponding figure in animals successfully infected was 0·49 mg. per gramme. Curative experiments were similarly successful.

Absorption.

A section through the site of inoculation showed a central zone where the tellurium persisted for weeks or months as acid crystals or amorphous granules; the time depended on the form of drug used, the element remaining the longest. This central zone was surrounded by a layer of polymorphonuclear leucocytes and muscular fibres injured by the coagulation necrosis, with small needles of tellurium lying between the fibres; yet further out lay reaction tissue composed of new vessels, muscle-fibres, and many mononuclear leucocytes.

Tellurium was found generally throughout the body, but only two parts are of special interest.

The basal part of the *intestinal glandular epithelium* showed the drug lying surrounded by mononuclear leucocytes and elimination by the mucosa is thought to be preceded by an accumulation of tellurium in the cytoplasm of these surrounding cells. The *kidney* showed a slate-coloured cortex, but the medulla appeared healthy. On section the epithelium of the convoluted tubules and the intermediate portion of the ascending loop of Henle was found to be literally packed with tellurium "granulations," while they were very rare in the glomeruli or the tubes of Bellini.

"Granulations" are composed of grains of tellurium, ½–1 μ long, fixed in the excretory cells. Water, by its oxidising power, shows a distinct difference between tellurium injected into muscle and tellurium as found in the renal cells. The former resists water for a long time; the latter is quickly oxidised and easily soluble. The former is insoluble in lipoid solvents, and thus is precipitated by alcohol from the kidney, and in this way a rich watery extract, which is non-dialysable, may be made.

The action of the metal on the spirochæte in vivo became apparent on the second day, being shown by irregularity of the spirals and the appearance of lumps and terminal granules. Later, phagocytosis occurred. The spirochætes most affected were phagocytosed first, and were fixed most easily by silver.

In Levaditi's opinion, injected tellurium becomes soluble by combining with tissue protein to form a complex proteo-metallic substance dissimilar to the original element. The mononuclears, apparently by their mitochondria, assimilate this and reduce it as a means of defence against the toxicity of the soluble tellurium derivative.

Clinical Studies.

Fournier and others [2] have tried various preparations of tellurium in the treatment of human syphilis. The element itself, the oxide (TeO_2) and the iodo-quinine gave the most promising results. In early cases the spirochætes disappeared by the second, third, or fifth day after administration; the chancre cicatrised rapidly and the glands receded. In florid syphilis the rash quickly faded, and the flocculation test or Wassermann reaction became negative. Subjective improvement and a tonic effect on the general health was obtained in two cases of central nervous system involvement. In this series 14 cases were treated with tellurium alone. One case was resistant, and did not improve, and one relapsed after treatment was stopped; all the others reacted successfully. No toxic effects were found, except a constant odour of garlic in the breath and in some cases a bluish discoloration of the skin, especially where it was exposed to the sun.

The route chosen was the intramuscular in all cases.

WASSERMANN-FAST CASES.

It is evident that tellurium is a powerful anti-syphilitic drug which would undoubtedly be more widely used but for the inevitable smell of garlic following its administration, and the fact that bismuth seems to act almost identically without producing this odour. There remains, however, one class of case in which tellurium might be useful—namely, the Wassermann-fast case, where, in spite of the exhibition of arsenic and bismuth or mercury, the patient does not react serologically and lives with the possibility of recurrence of clinical manifestations of the disease hanging over his head. Tellurium has not, as far as I know, been tried in this type of case. Seven patients were, therefore, selected and treated with the metal over varying periods of time.

A 5 per cent. suspension of the element in glucose was obtained* and tried first in the treatment of experimental *Spirochæta muris* infection in rats. It was hoped by this means to make an estimation of the probable spirochæticidal power, but unfortunately the drug showed very little activity against this infection, the results agreeing with the poor results obtained with gold and bismuth.[3] Patients were selected whose Wassermann test continued to give a positive result after intensive treatment with arsenic, bismuth, and mercury. A course consisted of about 5 c.cm. of tellurium suspension given intramuscularly in ½–1 c.cm. doses at intervals of 5–7 days. A month's rest was then allowed before the Wassermann reaction was tested. The details of the cases are as follows:—

Case 1.—Male, age 47. Date of infection unknown. Clinical condition syphilitic leucoplakia. Small doses given as general health poor. 2 g. neokharsivan and 2 g. bismuth in eight weeks. Developed jaundice. 14 g. bismuth only administered in next 12 months, followed by a course of 2 g. neokharsivan and 2 g. bismuth. Total of 4 g. neokharsivan and 18 g. bismuth in 17 months. Wassermann reaction always strong positive.

2·5 c.cm. tellurium given. Wassermann reaction negative, relapsing to doubtful negative in eight weeks, and to weak positive in six months.

Case 2.—Male, age 64. Infected 40 years previously. Clinical condition syphilitic leucoplakia. During second course of treatment with neokharsivan and bismuth a dermatitis developed. Arsenic stopped and bismuth

*Kindly supplied by Burroughs Wellcome and Co.

continued in small doses. Total 5 g. neokharsivan and 12 g. bismuth in one year. Wassermann reaction always strong positive.

Given 5·5 c.cm. tellurium. Wassermann reaction doubtful negative. Treatment with bismuth was restarted, but the Wassermann reaction relapsed to weak positive in five months. Still weak positive nine months later.

CASE 3.—Male, age 47. Infected 20 years previously. Clinical condition syphilitic hemiplegia. Received large quantities of various "606" and "914" preparations, intravenously and intramuscularly, including silver salvarsan, sulfoxyl salvarsan, sulfarsenol, &c., also bismuth and mercury over a period of six years. Wassermann reaction varied between strong and weak positive. Given 6 c.cm. tellurium. Wassermann reaction negative. Ten weeks later still negative. Six months later weak positive.

CASE 4.—Male, age 59. Infected 20 years previously. Clinical condition syphilitic leucoplakia. Received 6 g. silver salvarsan, 8 g. "914," 25 grs. mercury, and 13 g. bismuth over a period of two years. Wassermann reaction varied between strong and weak positive. Given 5 c.cm. tellurium. Wassermann reaction negative but relapsed in one month to weak positive.

CASE 5.—Male, age 52. Infected four years previously. Wassermann found strong positive during routine examination. Treated for six years with "606," "914," mercury and bismuth. Wassermann reaction always strong positive. Given 8 c.cm. tellurium. Wassermann reaction unchanged.

CASE 6.—Male, age 62. Infected 26 years previously. Clinical condition gumma of sternum. Received 15 g. "914" and 25 g. bismuth during two years. Wassermann reaction always strong positive. Given 5 c.cm. tellurium. Wassermann reaction unchanged.

CASE 7.—Male, age 65. Infected 21 years previously. Clinical condition ulcerating gumma of leg. Received large quantities of various "606" and "914" preparations. also bismuth and mercury over a period of five years. Wassermann reaction strong positive. Given 4 c.cm. tellurium. Wassermann reaction unchanged.

CASE 8.—(This case will be discussed separately).—Male, age 25. Started treatment two years three months previously for chancre and strong positive Wassermann reaction. Wassermann reaction had been negative for one year when he reported with a history of coitus, a penile chancre swarming with *S. pallida*, and Wassermann reaction strong positive. Given 2·5 c.cm. tellurium. Wassermann reaction negative and has remained so under treatment with arsenic and bismuth.

TOXICITY OF TELLURIUM.

The toxicity of the drug in the doses given appears to be small. No emaciation or discoloration of the skin occurred in this series, although both have been reported elsewhere.[4 2] Perhaps a stronger sun than we can command in Edinburgh is required to produce the bluish discoloration described by Fournier. The most prominent side-effect is a smell of garlic. The drug is excreted as methyl telluride through the lungs and in the urine, and produces an odour which is constant, overwhelming, and extremely persistent. To counteract this, large doses of sodium thiosulphate were given orally and intravenously but with little effect. Strong-smelling orange mixtures did not influence it, and it was really this odour which made us give up the use of the drug. A faint smell would persist even 6–8 months after the last injection. It is said that workers in tellurium mines are affected in the same way but to a lesser degree.

Loss of hair pigment, due to tellurium has been reported, and this did occur in Case 8. A week or two after the first injection the hairs slowly grew white, not in patches but generally over the scalp. This persisted for about four months when the black hair reappeared, and by another four months no white could be seen. This is a rare manifestation of intolerance.

Discussion of Results.

The average age of the infection in the cases treated is nearly 19 years. This bears out the rule that the longer the duration of the disease the more firmly is it entrenched and the greater is the probability of a resistant infection developing. The cases in this series constituted a very severe test for any drug, and yet four cases out of the seven selected were influenced favourably by the tellurium preparation. In time the Wassermann reaction relapsed, although usually to a lesser degree of positivity than before this treatment. This was probably due to the fact that the quantity of tellurium in the tissues fell below the necessary level for therapeutic action. There is no reason to suppose that the Wassermann reaction would ever have returned to positive if more tellurium had been administered.

The smell of garlic is inextricably bound up with the excretion of the drug, and there seems to be no way of evading its presence or of alleviating its intensity. The other side-effects are rare, and in countries where the smell of garlic is not commented on, this drug should prove of great value. In special cases in our own country it may be the only means of affecting the Wassermann reaction.

One further possible use may be mentioned—namely, for prophylaxis. Case 8 was one of those cases with which we cannot deal satisfactorily under present conditions.

His unfortunate habits had resulted in gonococci being present continuously in his urethral secretion for almost two years. We can only surmise how many people he had infected in that time. When on a course of very small doses of neokharsivan, near the end of his treatment for syphilis he exposed himself to infection, and developed a penile chancre swarming with *S. pallida*. His blood, previously negative, showed a strong positive Wassermann reaction. We decided that tellurium was the most suitable drug. The administration of 2·5 c.cm. of the suspension made his blood Wassermann negative, and it has remained so under treatment with arsenic. It is interesting to note that at the same time gonococci disappeared from the urethral and prostatic secretions, with the result that he has at last been cured of his gonorrhœa.

Other cases of gonorrhœa were tried with tellurium without effect. The result in this case must be credited to the enveloping smell of garlic which effectually prevented exposure to infection for at least six months.

Summary.

Tellurium is active in rabbit and human syphilis. Seven Wassermann-fast cases were treated with tellurium, and four were favourably influenced. The toxic effects are small, but a smell of garlic is constant; this, however, should not prevent the use of tellurium in certain countries and in certain cases.

I wish to thank Mr. David Lees and Prof. T. J. Mackie for their advice and interest during the course of this study. The expenses for the work were defrayed by a grant from the Moray Fund.

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CLINICAL AND LABORATORY NOTES

ADENITIS OF THE ILIAC GLANDS.

By R. J. McNeill Love, M.S. Lond., F.R.C.S. Eng.,
ASSISTANT SURGEON TO THE METROPOLITAN HOSPITAL.

Adenitis of the external iliac glands is a not uncommon surgical condition, and deserves wider recognition than it is usually accorded in text-books.

These glands are some 12 in number, and are arranged in three chains along the outer, middle, and inner aspects of the vessels; the lowest member of each chain lies close to the deep surface of Poupart's ligament, and together they form the retrofemoral group. The afferent vessels convey lymph from the deep femoral and some of the superficial inguinal glands, from the deep structures of the anterior abdominal wall below the umbilicus, from the bladder, and from the prostate, the uterus, and the upper part of the vagina. Thus a wide area is drained, but the commonest cause of inflammatory lesions is infection of the leg via the femoral group of glands.

As in other parts of the body, infection may "jump" one group of glands, and affect those more central; thus iliac adenitis may occur with no apparent inflammation of the inguinal glands. That it may be mistaken for a variety of conditions is illustrated by the following cases:—

Case 1.—A boy, aged 6, was admitted to hospital for immediate operation, on the assumption that he was suffering from acute infective arthritis of the hip joint, probably due to osteomyelitis of the neck of the femur. For three days he had complained of pain and stiffness in the hip, with increasing difficulty in walking. On examination he was obviously ill, with a temperature of 101·2° F., and a pulse-rate of 122. The right hip was rigidly flexed, and any attempt to increase flexion or to extend the joint was tearfully resented. A more detailed examination revealed a fixed, indurated, and tender swelling in the right iliac fossa, and rotatory movements of the hip could be obtained painlessly, thus disproving the diagnosis of acute arthritis, for which was substituted adenitis of the iliac glands with marked spasm of the psoas. No obvious source of infection could be discovered. The iliac swelling gradually increased in size; after six days an abscess was evacuated and recovery was uneventful. Staphylococci were the offending organisms.

Case 2.—A boy, aged 12, was admitted to hospital as suffering from an appendix abscess. Four days previously he had complained of abdominal discomfort which had increased and become localised to the right iliac fossa, and his doctor, on deep palpation, had discovered a tender swelling in that region. On admission the temperature was 100·4° F. and the pulse-rate 110, and on placing the boy prone it was found that extension of the right hip was limited as compared with the opposite side. Owing to the absence of more typical abdominal symptoms, a diagnosis of iliac adenitis was made, and this was supported by the presence of a chafed heel due to an ill-fitting shoe. Fomentations and symptomatic treatment were adopted, and the swelling gradually subsided and disappeared with attendant symptoms in about a fortnight.

Case 3.—A man, aged 39, stated that he had suffered for five days from left-sided abdominal discomfort, and increasing pain on walking, these symptoms becoming so distressing that he took to his bed and sent for his doctor, who found a tender swelling in the left iliac fossa and sent him to hospital with the diagnosis of diverticulitis with pericolic infection. On admission his temperature was 102·2° F., and his pulse-rate 108; a rounded painful swelling, the size of a large orange, was palpable above the left Poupart's ligament. Numerous infected gnat bites were present on both ankles. There was no previous history of any digestive disturbance. Two days later the swelling had increased in size, and was adherent to the abdominal wall immediately above Poupart's ligament. Half a pint of pus was evacuated, containing staphylococci, and recovery was uneventful.

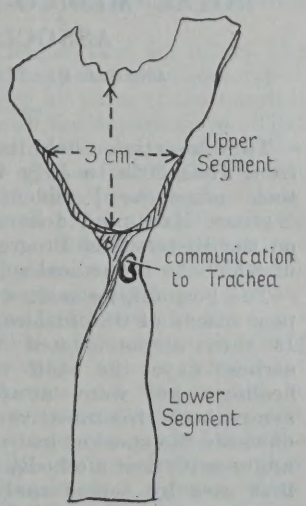
Adenitis of the iliac glands is, therefore, of surgical interest because of the possibility of mistaken diagnosis with the resultant risk of an unnecessary or injudicious operation. The gradual onset of symptoms, spasm of the psoas muscle, and often the presence of a focus of infection are all suggestive. Confusion with an appendix abscess may lead to evacuation through the peritoneal cavity, and consequent risk of peritonitis. If the condition is suspected or diagnosed, expectant treatment should be adopted, and if resolution does not occur, then the abscess should be opened through a small incision immediately above the outer part of Poupart's ligament, so that the pus can be evacuated extraperitoneally. Evacuation is facilitated by the fact that in all but small abscesses the peritoneum is already displaced upwards from the anterior abdominal wall.

CONGENITAL ATRESIA OF THE ŒSOPHAGUS.

By Cyril J. Polson, M.D. Birm., M.R.C.P. Lond.,
LECTURER IN PATHOLOGY, UNIVERSITY OF LEEDS.

Congenital atresia of the œsophagus is a rare condition, and an example, bearing a close resemblance to the four reported by Keith and Spicer [1] (1906), and that by Cooper [2] (1929), is now described.

A female child, aged 7 days, admitted to Prof. C. W. Vining's wards on May 24th on account of persistent vomiting which began on the 21st. It was born at full term and then weighed 7½ lb. When admitted it was a thin wasted baby weighing 4½ lb. The child became cyanosed when attempts were made to feed it, and all food was immediately returned; it was a hungry child. An œsophageal tube could not be passed more than one inch beyond the larynx. Death occurred on May 25th. At autopsy next day atresia of the œsophagus was found at the junction of its upper and middle thirds. The upper segment was dilated and hypertrophied, forming a wide pouch which had a smooth mucous lining; the lower was thin-walled and narrowed, but quite patent. There was a communication ⅛ in. in diameter between the upper end of the lower segment and the trachea at a point approximately ¼ in. above the bifurcation. There was a patent foramen ovale but no other congenital malformations.



Sketch of the œsophagus as seen laid open. The cut wall of the upper segment is shaded and indicates its thickness.

Keith and Spicer, when describing four similar cases, discussed the probable origin of this congenital malformation, and regarded it as a failure in the development of the tracheo-œsophageal septum.

[1] Keith, A., and Spicer, J. E.: Jour. Anat. and Phys., 1906-07 xli., 52.
[2] Cooper, T. V.: The Lancet, 1929, ii., 607.

They mentioned that Morell Mackenzie collected 63 cases, but had seen only one of them himself. The present case is the first amongst a series of 12,000 autopsies at the Leeds General Infirmary.

I wish to thank Prof. Vining for permission to use the clinical notes of this case.

CULTIVATION OF A TUBERCULOUS GRANULOMA IN VITRO.

BY THOMAS LUMSDEN, M.D. ABERD.,
DIRECTOR OF THE CANCER RESEARCH LABORATORY, LONDON HOSPITAL.

DURING routine cultivation of a series of human neoplasms small fragments of a tuberculous mass arising from the spinous process of a dorsal vertebra, kindly supplied to me by Mr. Robert Milne, were cultured in the serum of the patient, a boy 8 years of age. After 24 hours endothelial cells migrated out freely from the original fragment forming an irregular network around it. The cultures were re-fed with the serum every four to five days, and were still alive a month after removal from the body.

It was observed that the migrating cells were of three varieties: (1) Lymphocytes which disappeared after a week's cultivation. (2) Endothelial ("epithelioid") cells. (3) Fibroblasts. The chief interest attached to the endothelial cells. Some of these divided after their emigration; others, which could be individually recognised, survived without division during the whole month. Of the latter several gradually enlarged and their nuclei divided, probably amitotically, so that five or six nuclei coexisted in a single cell. These cells resembled the giant cells which occur *in corpore* and as in them the nuclei tended to locate themselves at the periphery of the cytoplasm. In certain instances some of the nuclei migrated out from these giant cells with some attendant cytoplasm but remained attached to the parent giant cell by fine strands, giving very much the appearance familiar in microscopical sections of a miliary tubercle.

It appears therefore that, at least under the artificial conditions inseparable from tissue culture, giant cells are formed, not by the fusion of cells originally separate, but by repeated nuclear division without coincident division of the cell cytoplasm. The observed facts suggest that in the formation, under the stimulus of tuberculous infection, of a miliary tubercle, a single endothelial cell transforms itself as above described into a giant cell. This throws off from its circumference an encircling and adherent group of separate mononuclear endothelial cells. Lymphocytes, which are probably protective in purpose, accumulate from the blood stream, completing the characteristic picture.

MEDICAL SOCIETIES

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

ANNUAL MEETING AT OXFORD.

THIS Association held its annual meeting at Oxford from June 30th to July 4th. Dr. T. SAXTY GOOD took office as President, in succession to Dr. NATHAN RAW, and delivered a presidential address on the History and Progress of Littlemore Hospital, of which he is medical superintendent.

The hospital, he said, was opened in 1847 for the poor insane of Oxfordshire, Abingdon, and Berkshire. It then accommodated 134 patients. From the earliest days the staff were interested in mental healing and were aware that occupation and sympathetic treatment were essential. From 1911 onwards the speaker had made tentative attempts to apply analytical methods, and in 1915 he treated his first case by actual analysis. During the war, in company with Prof. William McDougall, he began to treat out-patient cases from surrounding camps, and this had led to the foundation of the out-patient clinic for nervous disorders at the Radcliffe Infirmary. In 1918 Littlemore was taken over by the War Office under the name of Ashhurst Hospital. During the war period hypnosis was much used, but since then it had been found less and less valuable while ordinary analysis was increasingly employed. In 1922 Littlemore was reopened as a mental hospital. War experience had shown the importance of the open-door system, and structural alterations were made accordingly. Windows were lowered, bars removed, wards made larger, and single rooms reduced in number. The results were admirable. Nurses were now trained in handicrafts so as to encourage the patients to imitate them, and an interchange of nurses between Littlemore Hospital and the Radcliffe Infirmary was proving very useful.

The outstanding features of care and treatment at the hospital the president summarised as follows: (1) the open-door system; (2) new patients are always told where they are and why they have been sent to the hospital; (3) all delusions and hallucinations are discussed with them; (4) they are always listened to, and their remarks are investigated; (5) they are always told when they are to be moved to another ward, and why; (6) the general rule of the hospital is to try all methods, both physical and psychological.

Mental Changes in Cardiac Disease.

Dr. A. G. GIBSON said that the results of cardiac deficiency need not be limited to its effects on the circulation in the brain, for there might be secondary effects from changes in the glands and other organs disturbed. Pericarditis in children sometimes caused querulousness and neurasthenia, and angina pectoris patients were often emotionally unstable. Children having cardiac failure in association with diphtheria were acutely conscious of approaching death until the final stupor. Aortic regurgitation, especially the syphilitic variety, might be associated with impulsive insanity. In people of advanced age Clouston observed a cyanotic delirium and cyanotic insanity due to lack of oxygenation of the blood; it was seen in bronchitis, cardiac disease, and asthma. Carey Coombs, reviewing 2000 cases of cardiac disease, could not find support for the view that cardiac disease in itself was responsible for mental disease, for he found only ten cases of insanity associated with rheumatic heart disease. Riesman, on the other hand, said that cardiac patients were often depressed and irritable, and that, especially if aortic disease was present, there were frequently

hallucinations of sight and smell. Some showed acute mania which defied control.

Dr. Gibson had found that patients with gross cardiac failure might show no mental change beyond a gradual enfeeblement of the mind. He had analysed the 153 of his cardiac cases in which there were mental symptoms, with the following result. In mitral stenosis 16 per cent. had mental change, in fatty infiltration 15·3 per cent., and various other conditions gave 6·1 per cent. of altered mentality. Mitral stenosis and ischæmic necrosis seemed more likely than other cardiac lesions to cause mental symptoms. When these were due to cardiac disease or faulty action, they rapidly improved if the heart's activity could be restored to the normal. A danger lay in wrongful certification when physical examination was omitted.

Sir HUMPHRY ROLLESTON pointed out that mental disorder in cardiac failure might be due to conditions classed as uræmic. In some cases, loss of mental balance might be attributable to treatment —e.g., by salicylates. In ischæmic necrosis the mental condition was, perhaps, due to the rapid fall of blood pressure.

Prof. WALTHER SPIELMEYER (Munich) read a paper on the Influence of Functional Circulatory Disturbances on the Central Nervous System. He spoke of changes in which there was no apparent change in the vessel wall or in the lumen, but which nevertheless caused functional disturbance.

Sedatives of the Central Nervous System.

Prof. J. A. GUNN said that drugs produced their action by a chemical interaction with the tissues, and as the chemistry of muscle differed from that of nerve, their selective action could well be understood. It was not yet known what was the chemical basis for this selective action, but considering, for instance, the extraordinary complexity of the cell and the complexity of such a molecule as that of strychnine, it was not surprising that the drug should pick out one cell in preference to another. The simpler the molecule, the less selective action was likely to be exerted. Though no chemical reason could be given for the selection exerted by certain drugs, much valuable knowledge had been derived from careful observation of their effects, especially the order or rotation in which they affected various tissues. Prof. Gunn urged that those employing sedatives should furnish exact records of their effects; every small fact was important. Some people had the idea that because a small dose of a drug sufficed, it was therefore a safer drug, but the contrary was true.

Psychotherapy at Out-patient Clinics.

Prof. GEORGE M. ROBERTSON pleaded for the extension of out-patient mental clinics. Many believed that every mental hospital should have a clinic or clinics connected with it, and with the Mental Treatment Act becoming operative this became a duty. Formerly the interest of the mental hospital medical officer started with the entry of the patient into the institution after his certification, and ended when he was restored to his family on discharge. This implied a lack of experience and understanding on the onset of mental disease, and of preventive treatment. Clinics brought the medical officer into closer contact with the domestic life of the poor, and this closer touch must dispose of much of the suspicion usually attaching to the treatment of mental disease, at the same time bringing the mental hospital doctor into a better appreciation of the problems of general practice.

Clinics tapped a large field of minor mental ailments which caused great suffering, but often received scant attention even from the practitioner, who merely regarded such patients as troublesome. Children were brought who were backward at school, who had been difficult to manage, or who on account of minor delinquencies had been difficult to manage at home. The best form of out-patient mental clinic was that attached to a general hospital, for a patient at such an institution had little hesitation in asking for advice on nervous symptoms, and there was the further advantage of a specialist staff and a laboratory. The clinic should be in charge of an experienced psychiatrist, and there should be coöperation with the neurologists of the hospital. Another method was to have the clinic in association with a mental hospital. This had the disadvantage that people were shy or afraid of approaching a mental hospital, but in various ways the difficulty could be minimised. As most mental hospitals were built in the country and were at some distance from centres of population, a mental clinic must be opened in the nearest large town, and, if possible, in connexion with the local hospital. As a supplement to the clinic there should be one or more social workers who should take notes when the patient was being examined and, if necessary, visit the patient's home and make discreet observations and inquiries. She should also try to ascertain whether the treatment was or could be carried out.

The object was to try to treat mental ailments at as early a stage as possible, and under the Mental Treatment Act it was possible to treat cases of mild melancholia in these clinics. He thought that the passing of the Act to admit voluntary patients to county mental hospitals should be signalised by the opening of out-patient clinics by the medical officers of these hospitals, so as to crown the benefits conferred by the Act.

Dr. WILLIAM BROWN hoped that in future the hospital managements would appoint a psychotherapist who should be in touch with all parts of the hospital and receive patients from all the departments. That meant education as to the needs, and it was a slow process. Many members of hospital staffs did not know the possibilities of the psychological side. Even in such a matter as the preparation of patients mentally for undergoing a surgical operation the psychotherapist had a real place. Accurate diagnosis and great discrimination were needed before psychoanalysis was embarked upon. He thought there was a danger of the possibilities of suggestion being neglected. Deep analysis could not be carried out in less than 50 to 60 hours, and that would be impossible in a mental out-patient clinic, but this did not mean that analysis would be neglected in the clinics. On the knowledge derived from complete analyses, much could be done in short séances. Moreover, in some cases it was useless and a waste of time to do much analysis, because the patient withheld important facts.

Dr. HUGH CRICHTON-MILLER thought all needed to have their eyes opened to the minor mental maladies of life. That they were very rife was shown by the number of attempts at suicide by people whose trouble was unsuspected. A clinic for dealing with these maladies could serve a great purpose, whether in association with a general or a mental hospital or an independent clinic. Much could be said for each system. Some advocated the establishment of clinics in association with the educational and scholastic system, an idea which was far from absurd. It must always be realised that each case required a great deal of time for treatment. There seemed to

be an impression that, provided a council gave a site and a grant for a suitable building, and someone gave leave to the staff of a local hospital to run it, everything for an out-patient mental clinic had been provided for. But, unless there was a positive therapeutic ideal, it was better not to ask county councils to put up clinics. At the Tavistock Clinic no one without adequate personal experience of analysis was allowed to use suggestion. After considerable experience it was found that each patient required on the average about 12 hours' attention.

Dr. HENRY YELLOWLEES referred to the admirable out-patient mental clinic in association with the Wakefield Mental Hospital, which under the new Act would probably be more valuable still. He said that the clinic established in connexion with the general hospital at York had had greater success after its name was changed from "clinic for functional nerve disorders" to "mental out-patients clinic." Sometimes an absurdly small amount of psychotherapeutical treatment brought a result which was marvellous to the patient.

Dr. R. D. GILLESPIE said it seemed that there were something like 3,000,000 cases of mental disorder in this country. At Guy's Hospital 75 per cent. of the children he saw either got well or were considerably improved, a figure nearly twice as good as in adults. He believed that if congenial occupations were found for those leaving school, possible breakdown later would be largely prevented.

Mr. L. G. BROCK said it might be worth while to try to get mental and general hospitals to jointly organise a travelling clinic, which should come within the reach of all potential patients. He looked forward to the time when besides the public mental hospitals there would be in all teaching hospitals and, he hoped, in the larger non-teaching hospitals too, a psychopathic unit, or at least wards for mental cases.

Dr. R. A. NOBLE said that in Australia the problem of out-patient treatment of mental cases had been widely and satisfactorily tackled. Success depended largely on the personality of the workers.

Dr. D. SLIGHT emphasised the need for psychiatrists taking a general medical viewpoint. In McGill University psychiatry was taught not as a special subject so much as a general approach to medicine.

Personal Communications.

Dr. G. F. PETERS read a paper on the Therapeutic Effect of Assisted Respiration in Established Cases of Dementia Præcox. It had been suggested, he said, that it might be profitable to explore a line of treatment based on the elimination of carbon dioxide without increasing the patient's acidity. With this object female patients at the Horton Mental Hospital suffering from dementia præcox had been treated by assisted respiration—i.e., Sylvester's method of artificial respiration, with modifications, was carried out for 15 minutes daily. After every five respirations a pause was observed, during which normal respiration was resumed. As volition increased, breathing exercises were introduced; dancing and skipping were also used. With the exercises tasks were introduced, at first those connected with personal hygiene. Of 12 cases so dealt with four showed moderate improvement, which had been well maintained for six months. Six showed slight yet definite improvement. The improvement was chiefly on the conative aspect. Two of the cases who failed to improve were so ill that from the first they might have been considered hopeless. The treatment seemed to provide the first step towards re-establishing contact with social activity. It had been necessary to use to the best advantage in the process of re-education the knowledge of the patient's previous history.

Dr. D. K. HENDERSON and Miss S. MACLACHLAN read a paper describing two cases of Alzheimer's disease with post-mortem findings on fatal cases.

In one typical case, that of a woman aged 51, there was a gradual failure of mental power; the patient became suspicious and jealous, was perplexed and disorientated for both time and place, and experienced difficulty in expressing her thoughts. She was ill 4½ years, and shortly before death she had contractures. At post-mortem a striking alteration was found in the neurofibrils. In an otherwise normal cell there appeared at first one or more fibrils, and these stood out prominently. Many neighbouring fibrils were similarly affected, and these formed bundles, which gradually came to the surface of the cell, and nucleus and cell disintegrated. Throughout the cortex were found many similar foci or plaques.

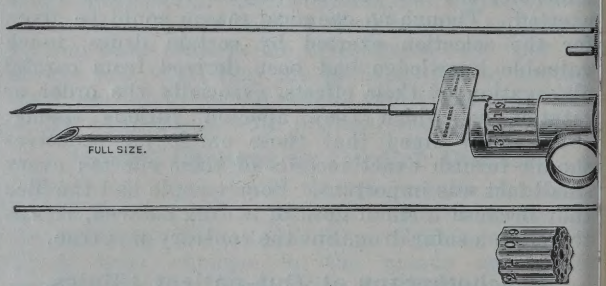
The cases must be distinguished from ordinary senile mental disease. British literature contained very little reference to the condition.

Prof. C. G. SELIGMANN read a paper on Temperament and Insanity in the Far East. He pointed out that while the virus of a disease might be much the same its manifestations were modified by peculiarities of environment, temperament, and habit. Hysteria was common among the Chinese, and they were very suggestible; 30 per cent. of the asylum population in Japan had general paralysis of the insane.

NEW INVENTIONS

RADON SEED INTRODUCER.

THE introduction of large numbers of radon seeds into the tissues with the ordinary trocar and cannula is a somewhat tedious process, and I have therefore designed a magazine introducer shown in the illustration with a detachable magazine carrying ten



seeds. The introducer is held in the left hand, and the magazine is rotated by the thumb, while the plunger is pushed in with the right hand. In this way ten seeds can be pushed home with great rapidity, whilst they can be planted in rows with remarkable accuracy, the cannula being withdrawn a centimetre or so after the introduction of each seed. The saving of time is considerable, but perhaps even more important is the gain in precision in the distribution of seeds. The original instrument was made in my own workshop at the London Hospital, and its use over a period of several months has convinced me of its great convenience.

The instrument is now being manufactured by Messrs. Down Bros., of St. Thomas's-street, Borough, London, S.E.

H. S. SOUTTAR, F.R.C.S. Eng.

REVIEWS AND NOTICES OF BOOKS

Insects, Ticks, Mites, and Venomous Animals of Medical and Veterinary Importance.

Part I.: Medical. By WALTER SCOTT PATTON, M.B., Ch.B. Edin., F.E.S., Dutton Memorial Professor of Entomology, Liverpool University and Liverpool School of Tropical Medicine; and ALWEN M. EVANS, D.Sc., Lecturer on Entomology in the School of Tropical Medicine. Privately published. Pp. 786. 20*s*.

THE size of this book is accounted for by its design; the authors, finding no comprehensive treatise, either of a theoretical or practical nature, dealing with the insects and acari which are of importance from the medical standpoint, have decided to fill the gap. This they are well qualified to do as, to quote Prof. Newstead's foreword, "Both have laboured in the fields of medical and veterinary science for many years, and both are highly distinguished experts in their subjects of which they treat."

The volume under review is the first of four; it deals with the medical and veterinary aspects of entomology, and is planned to meet the needs of candidates for the diploma in tropical medicine in the University of Liverpool; this is the first objective, but the information will be equally valuable to those who aspire to cognate diplomas at other university centres. Further, no intending examinee before any qualifying body can possibly require one-tenth of the information supplied. For the authors have purposely written, at the same time, with that large and important section of the profession in their eye, who, as medical officers of health, have obtained already a special diploma but require to have by them, for their instruction, a text-book in which they will find not only the information which they had mastered formerly for the purposes of examination but also a practical guide to their future work. It is intended that the work should not be used as a cram book for a particular examination, but should be of continuous utility as a contribution to the whole subject. Therefore particular stress is laid on morphology, without a knowledge of which it is not possible either to recognise the various insects, when to do so may be of the first importance in preventive medicine, or, indeed, to take an intelligent interest in their pathological rôles.

The all-round nature of the book, which accounts both for its size and its profuse illustration, is indicated in a synopsis of the preliminary lecture in the course given to the Liverpool students. In this lecture will be found what amounts to an introductory résumé of the contents of the book. A classification is given of the parasites and their carriers with which familiarity is expected, and that classification, which extends over 36 pages, is accompanied by really beautiful illustrations. The insects which form one of the most important classes, the *Phylum arthropoda*, include 500,000 individuals which have been described, and probably half as many again remain to be discovered. Of this vast population a large number will be found fully set out, their portraits, mainly by Mrs. Patton, accompanying the text. The instruction given by a good drawing of a specimen or insect can hardly be exaggerated, and for it to be of full value it is necessary that the various parts displayed should be easily recognisable by lettered descriptions. A feature of many of these illustrations is the elaborate lettering of the drawings for which Miss M. Brown is responsible. The numerous drawings of mosquitoes are by Mr. A. J. Engel Terzi, whose assistance to medicine in this direction is familiar.

It is proper to note that this work replaces Patton and Cragg's "Text-book of Medical Entomology," which is now out of date and out of print. That book was published 16 years ago and remains to-day the only comprehensive treatise on the subject. The present volume has been published privately and is sold at a price within the reach of all to whom it may be of use. The volume can only be obtained from the Entomological Department, Liverpool School of Tropical Medicine, and any number of copies can be sent. The extraordinarily low price, 20*s*., includes packing and postage to any destination, and all copies going to the United States will contain an invoice for Customs purposes.

Uniform with this volume, Part 2 on Public Health, Part 3 on Tropical Hygiene, and Part 4 on Veterinary Medicine, in relation to entomology, are announced for early issue.

The Diagnosis of Health.

By WILLIAM R. P. EMERSON, M.D., Medical Consultant in Physical Fitness at Dartmouth College, U.S.A. London: D. Appleton and Company. 1930. Pp. 272. 10*s*. 6*d*.

WE commend this book most heartily to the promoters and organisers of societies for the maintenance of health, especially to those whose propaganda is based upon too facile hypotheses. By such apostles—those who impose shallow views upon the public as being the secret for the eradication of disease—this book should certainly be studied; for if they have themselves taken the trouble to do the work involved in grading various states of health, constructing endless weight tables, making "personality examinations," and deducing "health intelligence quotients," based upon examination and interrogation of a very complicated nature, they will be able to compare American methods and results with their own. If, on the other hand, they have been content merely to bask in beautiful health dreams, they may be stimulated as they read to begin to get down to physical facts and to join in the search for truth—in short, to do some work.

To the physician whose professional time is mostly occupied with practical details in diagnosis and treatment of sick persons the book will make but slight appeal. He will be inclined to doubt whether health can be numerically assessed in percentages and quotients; and even whether the elusive personal equation in each case can be solved by analysis of the patient's personality into 17 component parts, such as reliability, sportsmanship, care of own and other's property, and coöperation, as enumerated in Chapter VIII. Moreover, it is quite likely that physicians might feel that principles of safety first, which must be the primary motive of Dr. Emerson's wide researches, would tend to direct the attention of normal persons too much towards standardising their health at the expense of their civic and cultural development. However, in so far as the book is founded on carefully ascertained facts and not on theory, it must command the respect of all interested in hygiene. Whether the aberrations from the averages constituting "optimum health," in Dr. Emerson's phrase, are properly regarded as physiological variations, or as danger signals on the border-

line between health and disease, will depend upon every man's individual perspective. But his method of study is conscientious, and it may lead to valuable knowledge.

Les régimes du nourrisson.

By E. LESNE and ROBERT CLEMENT (l'Hôpital Trousseau). Paris: Gauthier-Villars et Cie. 1930. Pp. 172. Fr.25.

THIS book consists of two parts, one dealing with the diet of normal infants and the factors concerned with growth, and the other with the feeding of sick infants. A clear account is given of the underlying principles of infant feeding, but in the chapter on artificial feeding with fresh milk the process of simplification has been carried too far, milk modification being dismissed in a few lines. The various methods which are used in the feeding of infants suffering from marasmus and other alimentary disturbances are more fully discussed. Considerable attention is paid throughout the book to the quantitative aspect of infant feeding.

Journal of Pathology and Bacteriology.

Vol. xxxiii., No. 3. July, 1930. Pp. 501–848.

Epidermoid carcinoma of the head and neck with special reference to metastasis, by R. A. Willis (Heidelberg, N.S.W.). A careful anatomical study of 20 cases of epithelioma of the mouth and adjacent parts. Remote visceral metastases occurred in ten cases, always from penetration of the large veins of the neck. Liver metastases are most frequent; they may penetrate the portal veins again and form the source of a secondary series of metastases in the liver.—The relative insusceptibility of young rabbits to streptococcus toxin, by H. J. Parish and C. C. Okell (London).—Gelatinous degeneration of the bone marrow, by P. Michael (Montreal). To be distinguished from œdema by the threads of precipitated fibrin about the periphery of the fat cells. Most commonly found with tuberculosis.—The ætiology of lymphadenoma, by C. C. Twort (Manchester). Six years' exploration of most of the possible avenues gave entirely negative results; some strange "bodies" are figured.—Phagocytosis by bronchial epithelium in the lungs of mice, by E. S. Duthie (Dublin). Some of the "dust cells" are derived from the epithelium of the bronchi.—Variations in the growth of the Jensen rat sarcoma and the influence of technique, by Helen Chambers and G. M. Scott (London). The rate of growth may vary enormously in different races of tame rats.—Experimental streptococcal infection and immunity, by A. W. Downie (Manchester). An important paper which should be studied in the original, leading to the conclusion that immunity to highly toxigenic moderately virulent strains is mainly antitoxic, while effective resistance to highly virulent strains is chiefly antibacterial.—The influence of cryptorchidism and of castration on body-weight, fat deposition, the sexual and endocrine organs of male rats, by V. Korenchevsky (London). Castration is followed by a decrease in body-weight, an increase of fat, atrophy of the penis, prostate, vesiculæ seminales and thyroid, and hypertrophy of the adrenals and pituitary. Bilateral cryptorchidism does not affect the pituitary or the body-weight; there is generally an increase in fat and a considerable atrophy of the penis, prostate, and vesiculæ seminales, and less constantly of the adrenals. Sexual hormones are produced by the seminiferous as well as Leydig's cells.—Bacteriophage reactions of Flexner dysentery strains, by F. M. Burnet and M. McKie (Melbourne).—Bacteriophage activity and the antigenic structure of bacteria, by F. M. Burnet (Melbourne). A very interesting discussion of the nature of bacteriophage action with the suggestion that it may be the heat-stable agglutinogens on to which phage particles are specifically adsorbed.—Observations on the variants of *B. subtilis* and their relations to the somatic and flagellar antigens, by N. C. Graham (London). Four variants are described with very marked differences in colonial appearance and bacterial form.—On the growth of endometrial transplants in the rabbit, by H. H. Gleave (Sheffield). The structure of endometrium transplanted into the liver of the same animal is the same as that in the uterus. Under the influence of corpus luteum hormone, œstrin, and oöphorectomy they show the same changes as the uterus.—Experimental cryptorchidism of pigs, by V. Korenchevsky (London). A coloured plate shows the complete disappearance of seminiferous tissue in the cryptorchid testes, the survival of the Sertoli cells, and an enormous overgrowth of the Leydig cells.—The action of certain dyes on the bactericidal activity of normal serum and on hæmolytic complement, by J. Gordon (Leeds). Congo red interferes with serum hæmolysis by combining with and inactivating the complement.—Vitamin D sclerosis of the rats aorta, by J. B. Duguid (Cardiff). The essential lesion is a muscle degeneration and calcification of the media similar to the lesions in adrenalin sclerosis in rabbits and Mönckeberg sclerosis in man; overgrowth of intima and fatty change are secondary.—Infectious ectromelia: a hitherto undescribed virus disease of mice, by J. Marchal (London). A general virus disease with lesions in the liver and spleen which often leads to gangrene and loss of a foot—hence the ill-chosen name. The cytoplasmic inclusion bodies are very large and abundant.—The titration of antipneumococcus serum, by H. J. Parish (London). Serum and culture are mixed, let stand for five minutes and then injected intraperitoneally into mice. There is no relation between the agglutination titre of a serum and its protective action.—The accuracy of titration of antipneumococcus serum, by J. W. Trevan (London). A mathematical examination of the preceding paper.—Atrophy of the adrenals associated with Addison's disease, by W. Susman (Manchester).—The incidence of atrophy and tuberculosis of the adrenal glands and their relation to Addison's disease, by F. F. Hellier (Leeds).—Adrenal atrophy in Addison's disease by W. G. Barnard (London) (see p. 148).—The irradiation of the blood in vitro, by A. Eidinow (London). Irradiation with a mercury-vapour lamp causes hæmolysis of red cells, destruction of leucocytes, methæmoglobin, and destruction of antibodies and complement. Intensely irradiated blood is toxic.—Transmission of maternal immunity, by J. H. Mason, T. Dalling, and W. S. Gordon (London).—Ligation of the hepatic artery, by G. R. Cameron and B. T. Mayes (London).—A direct method for counting the leucocytes, thrombocytes and erythrocytes of birds' blood, by A. F. B. Shaw (Newcastle).—Obituary of P. C. W. Laws.—Books received.—Proceedings of the Society, June 27th and 28th, 1930.—The soluble specific substances of pneumococcus type I: antibactericidal action skin reactions, by J. M. Alston, G. R. Galbraith and D. Stewart (Edinburgh).—The lowering of host resistance in experimental pneumonia, by J. F. Gaskell (Cambridge).—Septic thrombosis in puerperal septicæmia, by J. F. Gaskell (Cambridge). It is suggested that in some cases infection is kept up from an infected clot in the iliac veins after the uterus has returned to normal.—Asbestosis bodies in the lungs of guinea-pigs after three to five months exposure in an asbestos factory, by M. J. Stewart (Leeds).

NEW BRADFORD MENTAL INSTITUTION.—After seven years of discussion sanction has now been given to the erection by the Corporation of Bradford of a new institution for the reception of 240 mental defectives. The building, which will cost £105,000, is to be placed on the Corporation's Westwood estate at Clayton Heights.

THE LANCET.

LONDON: SATURDAY, JULY 19, 1930.

INSURANCE PRACTICE IN EUROPE: AN AMERICAN VIEW

In our issue of June 28th we took occasion to comment on a valuable report prepared by Dr. WILLARD C. RAPPLEYE as director of study of an influential American Commission on Medical Education. Though the report, further to consider which will be useful, consists chiefly of a study of medical education in certain European countries at the present time, it devotes attention also to the future career of the student after he has secured his hall-mark as a qualified medical practitioner. In this part of the report prominence is given to the conditions in which medical practice is carried on under the various European schemes of national insurance against sickness, for their working out has had a very important influence on medical practice in the countries in which they have been adopted. It is doubtful, indeed, whether the importance of that influence is adequately appreciated, even by the doctors who are engaged in insurance practice, and the sections of the American report which deal with the subject, and with unusual discrimination, may be studied profitably by all of us. For not only an interest in but sane comprehension of the principles of insurance practice is necessary for an appreciation of what the future may have in store for the profession of medicine.

The report shows that the modern development of national health insurance has brought about a fundamental change of view in regard to the objects it sets out to secure. Formerly it was thought that the chief aim of health insurance was to provide cash benefits for workers whom sickness had made incapable of work; the disabled wage-earner was given money to compensate him for the wages he had been compelled by sickness to lose. That is to say that insurance was then regarded as a form of compensation. It is now regarded as primarily a method of securing early restoration of working capacity. Compensation is recognised as an important, indeed an essential element in health insurance, but the main object now is to provide the treatment necessary to bring the patient back into a wage-earning condition. Restoration rather than compensation is the modern note. The results of this changed point of view are naturally most evident in the countries in which national health insurance has been longest in operation—namely, Germany and Austria—where the insured person is entitled not only, as in England, to the services of a doctor, but also to every kind of specialist and institutional treatment. Development along this line should call for our close consideration in view of the projected improvements in our own insurance service. In Germany, for example, the demands for specialist services have increased to such an extent that the insurance societies have felt compelled to adopt safeguards against abuse. Medicinal baths seem to be especially popular; the report gives an imposing list of 152,691 baths of 16 different types which in the year 1925 were provided for the insured persons of Leipzig as part of medical benefit. In the older insurance schemes medical provision has developed not only by the inclusion and steady extension of specialist services, but also by providing medical benefit to the dependents of insured persons, and here again the lesson may be informing in our own country. The report states that in Germany the insured persons, together with the dependents for whom medical benefit is available, form over 60 per cent. of the total population, while in some large towns the proportion of persons receiving benefits is thus brought to about 90 per cent. The significance of these developments will be obvious to our readers. Of the 47,000 medical practitioners in Germany it is estimated that not more than 5 per cent. are engaged solely in private practice; about 15 per cent. are in salaried positions, and about 80 per cent. are in the service of the insurance societies.

When insurance practice employs so many doctors, it is clear that the conditions peculiar to it are of vital professional importance, and some of the leading German insurance officials contend that the medical curriculum should include instruction specially devised to equip the student as a competent insurance practitioner. Pressure is being brought to bear on the medical schools to give more attention to the teaching of such subjects as the treatment of the diseases with which insurance practice is particularly concerned—e.g., rheumatism and the illnesses generally classed under this heading, the neuroses, common gynæcological conditions, the detection of malingering, and circumstances in which certificates of incapacity for work may properly be given. It is contended that doctors frequently certify patients to be incapable of work without due consideration of the various kinds of stresses involved in different occupations, and of the reactions of patients to work at varying stages of their illnesses. It is thought, for instance, that many patients certified as incapable of work on account of various forms of neuroses would be all the better in health if they went earlier back to work. Instruction in the medical schools on the precautions that should be observed in the issue of certificates of incapacity would, according to this view, enhance the efficiency of insurance practitioners and secure rational economies in the funds available for the provision of insurance benefits. There are enthusiasts who hold this view so strongly that they would wish to bring the medical schools somehow under some measure of insurance control. In all this our readers will see the reflection of views held or contested in this country. It is the British health insurance system, however, that receives most attention in the report, and the account given of the origin and operation of the

system is informative and accurate, except for some curious slips, such as the statement that the doctors' fees are distributed through the regional medical offices. The important part taken by the doctors in the administration of the scheme is pointed out, and the general conclusion is that national health insurance in this country has been advantageous both to the medical profession and the public. It is interesting to note that the results of this impartial survey, based as it is on careful inquiries made on the spot, are on the whole favourable to the system, whether regarded from the point of view of the doctors, the patients, or the public.

RETINAL DETACHMENT.

Dr. GONIN's treatment of detachment of the retina, which is referred to by Miss IDA MANN in another part of this issue, formed the subject of discussion, opened by Dr. GONIN himself, at a crowded session of the Oxford Ophthalmological Congress last week. Dr. GONIN's main thesis is that in every case of spontaneous detachment of the retina—i.e., cases apart from trauma, tumour, and albuminuric exudation from the choroid, it is possible to discover a hole in the retina if only we take enough trouble to look for it. The detection of this hole may be a matter of some difficulty, since it often lies far forward in the region of the ora serrata. The theory presupposes a partially liquefied vitreous, also the existence of vitreous tags adherent to the retina and thus capable of pulling on it, so that when a hole is made by traction there is free communication between the vitreous chamber and the inter-retinal space. Consequently, the only possible means of curing these detachments is to close the hole. This entails a most careful search, for the hole may be covered by a fold or may be too far forward to be easily visible. Typically it is of horse-shoe shape with the concave face directed outwards, but it may be round. If the lips of the hole can be sealed by means of the cautery the communication between vitreous chamber and inter-retinal space is permanently closed. Earlier operators who have employed the cautery have directed it towards the deepest part of the detachment, which is generally in the lower part; GONIN's new principle is to direct it always to the hole, which is often in the upper part. The success of his technique, then, depends first on the ophthalmoscopic detection and then on the accurate localisation of the hole. The fact that there have been undoubted cures following GONIN's procedure—the proportion of successes in recent cases is reported by him to be 60 per cent.—encourages the hope that a real advance in the treatment of this condition has been made. At the same time it would be wrong to encourage unjustified expectations of an infallible cure. In the first place, the method is only applicable to cases in which a hole can be discovered, and if the first attempt to close it is unsuccessful the operation may have to be repeated. In the second place, the holes may be multiple and a separate operation may be necessary for the closure of each. In the third place, even if the hole or holes have been successfully sealed, the condition which originally caused them—a diseased vitreous, or the stretching due to high myopia, or both—will still persist. Further, the operation itself is not free from risk; a hæmorrhage into the vitreous may occur which may make vision worse instead of better. At the Oxford Congress Mr. CHARLES GOULDEN reported that out of 11 cases in which he had performed the operation he had had nine successes but two had been failures from this cause. In this connexion the suggestion of Sir WILLIAM LISTER is valuable, that instead of allowing the cautery to penetrate as far as the detached retina itself, it would be better to stop it at the choroid, trusting to the adhesive inflammation set up opposite to the hole to close it.

In considering the prognosis of these cases it must not be forgotten that after having been detached for a period the retina loses its function. How long this period may be in any special case is unknown, but it is obvious that from the point of view of restoration of vision any operation is less hopeful the longer the detachment has been present. Also, it is a fact that, although the majority of cases of double detached retina at present inevitably end in blindness, there are cases in which a certain amount of useful vision is retained for years, even though the detachment persists. The possibility of making the vision not better but worse by operation must therefore never be overlooked.

The discussion at Oxford will long be remembered by those who were present and may mark the beginning of a new epoch so far as the treatment of detachments is concerned. So far only a few operators in this country have had practical experience of the method, but the results reported at Oxford were on the whole encouraging, and it is likely that others will familiarise themselves with a complex technique. Unfortunately, the operator cannot be guided by direct vision in directing the cautery. He has to find the hole with the ophthalmoscope, localise its position on the outside of the eye by minute and exact measurements, and then, after reflecting the conjunctiva, insert a Paquelin cautery at a place which his calculations have led him to believe is the right one. Ample warning was given at the Congress of the dangers of the procedure even in skilled hands, and it is unnecessary to emphasise here that the operation should only be attempted by those who have completely mastered the technique.

HOSPITALS AND MOTORING ACCIDENTS.

A YEAR ago we said in these columns, when drawing attention to the ominous prevalence of motoring accidents and the burden which this implied upon the hospitals and the medical profession, that, if the situation continued, legislation to relieve somehow and in some degree a scandalous state of affairs would be required. Last week an interesting debate ensued upon the point, and a certain degree of legislative remedy appears probable. Under the Road Traffic Bill the owner of a motor-car is required to take out an insurance

policy covering him against third party risks, while a subsection provides that, such a policy being existent and benefiting a third party, hospital expenses should be paid by the authorised insured in respect of the victims of motor casualties up to an amount not exceeding £25 for each person treated. In the course of the debate discussion was confined to consideration of the hard position of the voluntary hospitals, where beds are occupied by cases for which hospitality had never been contemplated, the claims for attention by individual practitioners not, apparently, being recognised in the Bill—at least in so many words.

The debate arose out of an amendment by Major HILLS to delete the subsection in question, and it must be admitted that he made a series of objections to the intended legislation which were logical. He pointed out that it would be a new departure in insurance law to call upon a motorist to pay, through the medium of a policy to an outside person, money which he was under no legal liability to pay at present; the provisions to bring this about would, he said, be exceedingly difficult to work. Further, he criticised the omission to extend the liability to vehicles owned by local authorities, and to drivers and their passengers. He was supported in his amendment by Mr. MORRISON, the Minister of Transport, who said that the matter was one upon which the Members of the House would be left free to express their opinion by their votes, a line of conduct which met with general approval. But the Minister then made a vigorous plea for State-run hospitals, finding in the position revealed by the debate one more argument for the taking over of the hospitals from their voluntary control. Mr. MORRISON saw in the inability of the voluntary institutions to meet the new and growing charge upon their accommodation and resources a vision that the State sooner or later would have to shoulder the burden, and, while he felt that those who voted to the detriment of the hospital finances might incur odium, he none the less found the challenged subsection a retrograde step. But although the proposer of the amendment and his supporters in the House, were able to criticise the terms of the clause effectively, no constructive proposals were forthcoming by which the immediate and growing evils could be met. The real effect of the passing of the amendment would have been that nothing could be done until the day arrived, if ever, when the establishment of State hospitals, over and above the present provision of this sort, was found by the country to be necessary. On this attitude two things call for obvious remark: first, there is no consensus of opinion that the voluntary principle has broken down, but on the contrary it has derived considerable strength from recent developments; and secondly, the admitted abuse of charities, often in pecuniary difficulty, must not remain indefinitely unrelieved.

Legislation is necessary, however illogical in its planning or difficult in its working, because the risk to life and limb is growing, and the number of persons who are trading upon the generosity of hospitals and individual practitioners seems to be growing also. The circumstances may often be unfavourable to the normal methods of charge and payment; the seriously injured person cannot arrange for the remuneration for his treatment, nor can this be expected from Samaritans who help him to hospital or surgery. We are happy to believe that the class of motorists that leaves its victims by the side of the road uncared for is quite a small one, and in this case if the offender makes good his escape it is clear that there is nothing to be done. But where elementary decency, aided sometimes by the fear of detection, leads the driver of the car which causes the accident to accompany the injured person to the place where medical succour can be given, he will yet hesitate to make himself responsible for the cost of treatment, and this not through meanness, but because any disbursement may present the appearance of admitting guilt, whereas it may be the intention strongly to contest that point. Much money to meet the heavy expenditure by hospitals upon motoring casualties may not be forthcoming through the insurance scheme, but, whatever it may turn out to be, it will be welcome.

BATHING IN THE SERPENTINE.

THE suggestion is made by *Civil Engineering* that a part of the Serpentine, containing some 3,000,000 gallons, should be enclosed by concrete and provided with a complete water purification plant. This brings up the large question whether people should ever bathe in large numbers in small open lakes. The Serpentine must, of course, be regarded as a large piece of water; it is nearly a mile long, and a rough estimate shows that its content is somewhere from 70 to 100 million gallons. Moreover, it is not altogether stagnant, for it was formed by damming the West Bourne, and this river still runs through the lake. In London we are not without experience of similar waters devoted to bathing; the Hampstead and Highgate ponds have been so used for years, and are not known to have spread disease. It is clear, however, that each bather must bring into the water a contribution of oxidisable organic matter and of bacteria. In water freely exposed to air, and containing a naturally balanced community of animal and vegetable life, the disturbance of equilibrium caused by a reasonable number of bathers would be small. In the Serpentine, assuming that there are a million bathers a year, the disturbance would be of the same order as the soiling of a large domestic bath by one bather, but this makes no allowance for the distribution of the million bathers over several months, and this provides the difference. On general æsthetic grounds the nearer the approach to natural surroundings the more pleasant things are for bathers and onlookers. It might, however, be wise of the Office of Works to have periodical analyses, chemical and bacteriological, of the water entering the Serpentine at the Kensington Gardens end, before it flows under the road bridge, and as it leaves the lake to flow over the fall at the eastern end. It is a great benefit to London that the finest sheet of water in the metropolis should be made available for a sport which has been too much neglected, but the two fatal accidents raise a doubt whether such a large, deep, and opaque mass of water should be used without restriction. Swimming baths are the only places where poor swimmers can bathe in perfect safety, and a good deal of protection and supervision may be required for young people.

ANNOTATIONS

THE OUT-PATIENT QUEUE.

In another part of this issue Dr. A. R. Friel offers suggestions for a time-saving reorganisation of ear clinics. A wider application of this sensible idea would rob hospital attendance of one of its most serious disadvantages in the eyes of the patient. It has recently been discovered that it is not essential to rouse in-patients at 4 in the morning to be washed; if it were also possible daily to save some thousands of persons three or four hours of wasted time, private practitioners would less frequently meet with evasion when hospitals are mentioned. For mothers with babies, attending children's departments, the long wait is particularly trying. Dr. A. G. Maitland-Jones at the London Hospital[1] has given expression to the difficulty of examining an overtired and irritable child. The nervous patient who has made the journey only after much encouragement and at the cost of considerable personal effort is rapidly demoralised by the delay; the busy mother is concerned for the uncooked midday meal, and the man from an office for the interruption of his business or that of his employer. Unfortunately, it is not easy to arrange an appointment system on so large a scale, especially where new cases are used for demonstration to students. Yet a certain order has been introduced into some clinics, notably at the out-patient department of the Birmingham General Hospital. It has been suggested that out-patient departments should be used for consultation only and not for teaching; if a social service were also established to relieve the physicians and surgeons of some of the clerical work, it would be possible for new patients to attend by appointment at half-hourly intervals on definite days. This would mean the loss of a very valuable form of instruction to the students, who probably see more variety in the out-patient department in an afternoon than in a week of ward rounds. The American system of a department open for the greater part of the day would reduce congestion but entail a much larger staff. The plan of working through the accumulated cases in batches, described by Dr. Friel, though admirable for an ear clinic, could scarcely be applied at a general hospital where all new cases must perforce be seen at their first visit. A possible alternative which suggests itself is that new patients only should attend at one session weekly. They should come by appointment for a consultation of length sufficient for the physician to make a provisional diagnosis and to estimate the interest of the case for teaching purposes. Old cases should attend on a different day, also by appointment, the length of the second interview having been estimated by the consultant at the first visit. It is not suggested that these estimates can be exact. The appointments could be made not to the minute but to the half hour; a period of waiting up to an hour or so is no more than the prosperous may have to suffer at the hands of dentists and specialists. The use of a little simple arithmetic of this kind on the part of the consultant or his house physician would avoid that exposure to students at the first interview which seems to be the dread of many patients. It should be possible, in any case, to devise some scheme to avoid the crowding of undiagnosed cases together for hours at a time. The canteens now opened for the patients at many hospitals, though a palliative, are a confession of failure in organisation.

[1] THE LANCET, 1929, ii., 79.

END-RESULTS OF EARLY SYPHILITIC MENINGITIS.

It has been known for some years that the cerebro-spinal fluid in about 50 per cent. of cases of secondary syphilis gives evidence of some degree of syphilitic meningitis. This may be slight or severe and in the latter case is often, but not constantly, associated with symptoms which indicate lesions of the spinal or cerebral nerve roots. This early involvement of the central nervous system is of great interest from two points of view. On the one hand its presence in the "latent period" after a year or more of active treatment is evidence that this treatment has been insufficient, and on the other hand it has been supposed, so far without any very definite proof, that cases of tabes and general paralysis are recruited from those who have had severe meningeal syphilis during the secondary period.

A paper by Paul Ravaut in the *Monde Médical* of June 1st goes some way towards confirming this supposition. His experience is a long one, dating back to 1903 when he first drew the attention of the medical world to the condition of the cerebro-spinal fluid in the early stages of syphilis, and the cases which he describes have been carefully watched over many years. He finds that cases in the secondary period may be grouped from this point of view into three main categories: (1) Those who never have any abnormality in the cerebro-spinal fluid. Among 91 such cases none developed later any evidence of neurosyphilis. In four cases the first puncture gave a normal fluid but a second puncture performed a few months later—i.e., still within the secondary period, gave a grossly abnormal fluid, and these patients developed neurosyphilis. (2) Those in whom the fluid showed only slight excess of cells and of protein with negative Wassermann and benzoin reactions. In practically all of these the fluid rapidly became normal and no further evidence of neurosyphilis appeared. In a few stronger fluid reactions were found at a later puncture, and some of these went on to neurosyphilis. (3) Cases in which the cerebro-spinal fluid, when examined within the first two years, was grossly abnormal, giving a high cell count and positive Wassermann and benzoin reactions. From this third group most of the cases of neurosyphilis were recruited, but in some the fluid cleared up and no later symptoms developed. When the reactions in the fluid disappeared slowly and incompletely the probability of the later development of neurosyphilis became considerable, and some patients developed tabes or general paralysis in spite of continued treatment. Malarial treatment, however, was not resorted to in any of these cases.

He found also that the changes in the cerebro-spinal fluid always preceded the clinical symptoms, and in some cases the fluid might be grossly abnormal for some time without any nervous sign appearing. This opinion was confirmed by Prof. Guillain, who examined several of Ravaut's patients at his request. But in the majority some slight clinical symptom or manifestation of nervous disease could be discovered. The practical lessons emerging from Ravaut's experience are, first, that the cerebro-spinal fluid should be examined during the secondary period, especially at the end of the second year; and secondly, that patients in whom grossly abnormal fluids are found should be carefully watched and treated until their spinal fluid becomes completely normal. Cases with

persistently abnormal fluids should be treated with especial thoroughness and, if necessary, subjected to malarial therapy, as it is probable that they are candidates for one of the chronic forms of neuro-syphilis.

ATMOSPHERIC POLLUTION.

THE fourteenth report of the investigation of atmospheric pollution covers the year ended March 31st, 1928. The early reports were issued as supplements to THE LANCET; then came a series from the Meteorological Office; this is the first report for which the Department of Scientific and Industrial Research is responsible.[1] The object of the investigation remains as before; it is to obtain exact information about the nature and extent of atmospheric pollution. But the form of the report is changing with the endeavour to make its main features easily and immediately intelligible to the layman. If this infinitely painstaking research is to produce benefits of practical value to the community, the results must be so expressed as to be readily assimilated by the public at large, and in particular by busy members of public authorities and their officials. The present report gives the results obtained from measurements of deposited impurity made with the standardised gauge, and suspended impurity as measured with the automatic filter and jet dust counter. Some data are also included on the measurement of daylight and ultra-violet radiation. Tar and sulphates, being practically entirely products of combustion, give the most trustworthy indication of smoke pollution, although carbonaceous matter, including soot, is very important. During the year the highest deposit of carbonaceous matter was found at Newcastle-on-Tyne, which station now holds the record for three consecutive years. The highest deposit of sulphates—viz., 140 tons per square mile—occurred at Burnley this year as last. The highest deposit of tar was at Salford (Peel Park and Regent-square), Newcastle-on-Tyne (City-road) coming next. The actual weight of tar deposited per square mile during the year at these stations was 36 tons at Salford and 20 tons at Newcastle. Side by side with current figures the report gives an average of the four or five previous years. On this basis London shows no improvement; at seven out of eight available London stations the sulphates and tar have increased when compared with the five years' average. Taking all stations together there is no general improvement. Tar is higher than the average in 11 and equal to or less than the average at 12 stations, while sulphates are higher in 22 out of the 23 stations. London and Glasgow illustrate the general tendency toward higher percentages of sulphates in the lower total deposits. It is somewhat remarkable that while a reduction of total deposit and of sulphates occurred in both cities from 1915–16 to 1921–22, improvement ceased about the latter date and there was a slight upward trend until 1927–28. The cause of this sequence is not obvious; an economic explanation has been suggested—namely, that the number of gas and electric heaters replacing coal fires reached a saturation point about 1921–22. It is curious that the changes should run so closely parallel in the two cities. The first appendix to the report by Dr. J. S. Owens shows the progress in using a scale of shades with the automatic recorder and in the matching of records. In the second, Dr. J. R. Ashworth surveys the pollution of the air in Rochdale. The fourth appendix describes generally the methods of measuring atmospheric pollution now in use. Finality is not assumed, and the Research Committee is engaged on the problem of measuring the sulphur compounds which cause such grave injury to buildings.

[1] H.M. Stationery Office. 3*s.* 6*d.*

THE PREVENTION OF BLINDNESS.

THE welfare of the blind, as a world problem, has lately been the subject of a report by the League of Nations,[1] and it is now proposed to approach the prevention of blindness from the international standpoint. The initial impetus in this direction was given by the League of Red Cross Societies, whose secretariat, having undertaken to study the sphere of various charitable organisations throughout the world in relation to the preventive aspect of blindness, have come to the conclusion that the one in which this object was brought nearest to practical realisation is the United States National Society for the Prevention of Blindness. Last autumn, coincidently with the meeting of the International Ophthalmological Conference at The Hague, the International Association for the Prevention of Blindness was definitely constituted, with Prof. de Lapersonne, of Paris, as its president, Dr. Humbert, of the League of Red Cross Societies, as its secretary-general, and an executive committee of thirteen, of whom Dr. Bernard Cridland is the British representative, to meet annually in Paris. The main function of the association will be to coöperate actively with any existing society or centre for the prevention of blindness in the various countries, or endeavour to promote the creation of such a centre or society where it does not already exist.

The League of Red Cross Societies[2] has now published the report on which this movement has been based. It helps to reveal the difficulties of comparison in this matter between the various countries of the world; it also does much to lay bare the actual extent of the problem in different countries, and it displays the efforts which some countries have made to deal with it. The first difficulty is the definition of blindness, which can only be scientifically accurate at the expense of any practical utility. For practical purposes every country has its own more or less loosely defined standard of vision, below which the subject is considered to be blind. For comparable statistics to be possible, it is obviously necessary that some sort of standard definition should be agreed upon. A second difficulty is that the most complete tabulation of world-wide blindness available at the present time is already twenty years old (United States Census Report of 1919). The greatest single cause of visual impairment and blindness in the world is trachoma, a scourge which affects the majority of the population of several Eastern countries but from which Western Europe is comparatively exempt. In England, in recent years, it has become almost rare, and as the few cases which occur are almost always promptly dealt with, and the immigration of trachomatous aliens is checked, the actual blindness from this cause is now almost negligible in this country. Next to trachoma, syphilis, acquired and congenital, and gonorrhœa in the form of ophthalmia neonatorum, are responsible for a large amount of blindness in all countries, and the hygienic measures adopted to combat them are of the first importance. Other main causes of blindness are discussed under the headings congenital defects, glaucoma, disease, and accidents. It is remarkable that in Western countries cataract does

[1] See THE LANCET, 1929, ii., 831.
[2] Address: 2, avenue Velasquez, Paris.

not appear as a numerically important cause of blindness, a fact which must be due to the efficiency of modern treatment. Myopia is also a very small factor in the causation of blindness, though a very large one in the production of various degrees of impairment of vision.

An interesting annexe to the pamphlet describes a typical case of national action by the American National Society for the Prevention of Blindness. Its activities include various services under the following heads: eye infections of newborn babes; eye clinics for pre-school children (age 3 to 6); saving the eyesight of children of school age, especially in connexion with sight-saving classes for myopic and other children with defective sight; trachoma; and eye hazards in industry. The account of this national society is included in order that it may be of service as an example to other countries where similar action is called for. In our own country much has already been done to limit the spread of venereal disease and to ensure the prompt treatment of ophthalmia in the newborn, but there are three directions in which such an organisation as is proposed might render great service to the community. One is the spread of knowledge amongst mothers of young children below school age as to the dangers of untreated squint and developing myopia. A second is to urge the establishment throughout the schools in the whole country of special classes suitable for myopes and other children with defective sight, similar to those already existing in London. Lastly, the provision of safeguards against accidental injuries to the eyes in industry is a subject where there is room for voluntary effort, especially in the matter of the wearing of protective goggles by the workers in certain trades—a task which could only be undertaken with any chance of success by members of a society in touch with ophthalmic surgeons on the one hand and with both the management of works and the men's organisation on the other.

ADRENAL ATROPHY.

THREE papers in the current number of the *Journal of Pathology and Bacteriology* (vol. xxxiii., p. 749) call attention to the fact that "simple atrophy" of the adrenals is by no means an uncommon basis for fatal Addison's disease. Tuberculosis is so generally accepted as the regular cause that the occurrence of any other morbid anatomy is sometimes overlooked though atrophy has, of course, been included in the list of possibilities from the beginning. In Manchester Dr. W. Susman has 5 examples of atrophy in 6 fatal cases coming to autopsy; in Leeds Dr. F. F. Hellier found 3 atrophies in 9 cases; and at University College Hospital Dr. W. G. Barnard records 7 in 23. Adding these together we have 15 atrophies in 38 cases, or 39 per cent., the other 23 cases being all tuberculous. Other English statistics quoted by Dr. Susman give similar results; 3 in 8 at Birmingham, 7 in 29 at Guy's Hospital; whereas from Germany we have 1 in 15, from Norway 2 in 22, and from America 5 in 44, a total for non-English places of 8 in 81 or 10 per cent. It looks as if there might be some curious geographical difference in the incidence either of atrophy or of tuberculosis of the suprarenals. Two further points of interest emerge. "Simple atrophy" is apparently a misnomer, but whatever the nature of the lesion it has a strikingly uniform histological appearance and the pictures published by the different authors, here and in America, might well have come from the same specimen. Islands of large, swollen, more or less degenerate cortical cells lie in a mass of fibrous tissue with considerable infiltration with lymphocytes which are sometimes aggregated into small lymphatic nodes. The changes are strangely reminiscent of those found in the thyroid in myxœdema, and Dr. Susman actually describes collections of lymphocytes in the thyroid and pancreas in some of his cases. If the lesion is primarily inflammatory no one has found any evidence indicating the cause of the inflammation; alternatively it might be originally toxic and degenerative, and there is nothing which gives any decisive help in making the choice between these two alternatives. The other point of interest is that in several of the cases the cortex only is involved, leaving the medulla substantially intact—an important piece of evidence in favour of the view, so ably advocated by the late Prof. G. N. Stewart, that the cortex is the organ whose failure causes death in Addison's disease, and not the medulla.

A STUDY OF TUBERCULOSIS BY GENERATIONS.

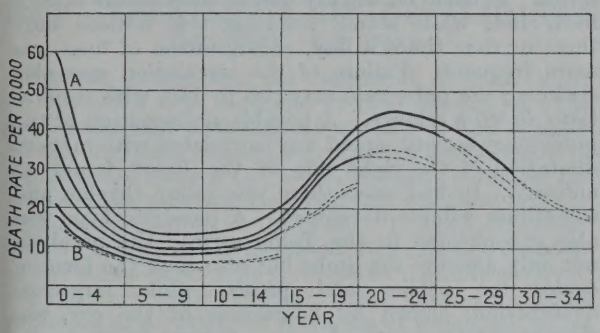
SOME two score years ago, a then obscure medical man in Norway published a statistical thesis whose gist was that the fatal pulmonary tuberculosis of adult life was merely the terminal stage of an infection in early childhood. This teaching was sheer heresy, and its author, Dr. K. F. Andvord, did not even enjoy the one privilege of heretics—persecution. He was simply ignored. And it was not till several years later that von Behring and his associates rediscovered this teaching which has now become acceptably orthodox. Meanwhile Dr. Andvord has completed a new study, which he has published in the *Norsk Magasin for Lægevidenskaben* for June, on the behaviour of tuberculosis in one and the same generation. He found that as far as towns and certain isolated areas were concerned, migration played too big a part to allow of a satisfactory study on the projected lines; but taking Norway as a whole, and noting the tuberculosis death-rate in five-year periods since 1896, he was able to follow the tuberculosis death-rate in the same generation, from childhood to middle age, and to compare the behaviour of one generation with another in this respect. The following table concerns some 300,000 persons in the

TUBERCULOSIS DEATH-RATE PER 10,000 PERSONS IN NORWAY IN VARIOUS FIVE-YEAR GROUPS SINCE 1896.

1896–1900	*34·2*	13·1	15·0	30·3	*45·0*	36·8	21·8
19.1–05	26·0	11·6	12·6	29·7	42·8	32·5	—
1906–10	20·3	9·5	10·9	27·4	34·0	—	—
1911–15	16·8	8·1	9·5	19·4	—	—	—
1916–20	13·9	6·4	6·3	—	—	—	—
1921–25	11·2	5·45	—	—	—	—	—
1926 & 27	10·2	—	—	—	—	—	—
Age-group	0–4	5–9	10–14	15–19	20–24	25–29	30–35

first five-year group, and some 200,000 persons in the same group when its members had attained the age of 20. In the first period, 1896-1900, the death-rate per 10,000 from tuberculosis was 34·2. It fell to 13·1 in the age-period 5–9, and rose to 45 in the age period 20–24. Taking each generation by itself in five-year groups, Dr. Andvord has prepared the chart here reproduced. The curve A represents the 1896-1900 generation, and the curve B the 1926-27 generation. From this chart Dr. Andvord argues

that once the death-rate from tuberculosis in the first five years of life in any generation is known, it is possible to calculate beforehand what it will be in the succeeding five-year periods of the same generation. He has already checked this claim,



confirming it by sending his forecasts of the tuberculosis death-rates in Norway in a sealed envelope to the Chief Tuberculosis Officer, Dr. Heitmann, with whose official returns Dr. Andvord's forecasts have hitherto shown a remarkable similarity.

BIRTH CONTROL.

THE practice of birth control has personal, marital, familial, racial and international implications, which have to be distinguished when judgment is passed on the subject as a whole. It is, perhaps, too soon to pronounce on its international implications, since not enough is known about the practice in different countries, and its relation to the ubiquitous fall of the birth-rate is still under dispute. It is possible, and desirable, however, to discriminate between the personal and racial aspects of contraception. In an address[1] by Dr. F. J. McCann, the President of the League of National Life, much stress is laid upon the medical harmfulness of contraceptive practices. The objects of the League of National Life are "to combat the theory and practice of Contraception; to oppose any form of State or Municipal assistance for the promotion of Contraception; and to uphold the honour and blessing of Parenthood." The League produces a monthly journal, *National Life*, the June number of which contains a supplement consisting of a symposium of quotations from speeches and writings of medical men condemning birth control.

In passing judgment upon the medical aspects of a subject so loaded with theological and moral implications as this, it is difficult to be detached. Dr. McCann claims to have formed his adverse criticisms impartially. He wrote in 1927 that his desire was "to seek the truth, not to manufacture a medical case against contraception."[2] This impression is not confirmed, however, by his use, in the course of his address, of such phrases as that the use of contraceptives is a degradation to woman, and that the practice of contraception is a deadly evil. The harmful effects of birth control were described fully by Dr. McCann in an earlier paper which was reviewed in THE LANCET of Nov. 19th, 1927, p. 1109.[3] In his more recent address nothing new is added. Dr. McCann selects for condemnation methods that are never advised at the birth control clinics. Thus corrosive sublimate (which is stated to be frequently used) and lysol are, so far as we know, never advised at birth control clinics. If, as Dr. McCann states, these substances cause mercurialism and vaginitis respectively, this must occur in women who use them without medical authorisation or advice. It would hardly seem logical to argue from this that the practice of contraception should not be medically supervised through municipal assistance. Dr. McCann's case in opposing such a measure would be immensely strengthened if he could quote instances of harm having been ascertained to follow from the use of methods of contraception that had been medically advised and medically supervised. Such cases, however, if they exist at all, are far from common, since the woman is examined and questioned about her health at each six-monthly visit which she is asked to make to the birth control clinic, and ill effects would be noted and corrected. A considerable body of evidence invalidating Dr. McCann's conclusion has been accumulated at these clinics. This evidence is entirely overlooked by those anti-birth control propagandists who make it their chief line of attack that birth control injures health.

The situation is otherwise, however, when the racial issues are considered. Though there is little or no evidence that contraception when medically controlled is physically harmful, there is abundant evidence that the existing methods, even when carefully taught, are found to be impracticable and unreliable by many people, particularly those of low grade stock. For the "social problem group" of the report of the Mental Deficiency Committee, existing methods are probably next to useless. All of them, with the exception of the intra-uterine ring, require forethought, self-control, or after care. They are, therefore, impracticable by persons who do not possess these qualities. A fairly thorough survey of the first 1000 cases that attended a London birth control clinic justified the statement that "The clinics have been powerless so far, to reach the obviously inadequate, mentally, socially, and economically," and "to limit the reproduction of those fertile individuals who constitute a serious problem—the feeble-minded, the insane, the chronic paupers, and the persistent leaners upon the State."[4] The author of this survey, Mr. Norman Himes, has recently published a statistical summary of certain of his findings relating to the types of contraceptive method recommended by nine British birth control clinics.[5] These conclusions are of very great interest to those concerned with the technical aspects of contraception, and they indicate that further coördination is needed in the medical services of these clinics. The most noteworthy of Mr. Himes's findings is this: Up till 1927, the most favoured method at the nine clinics on whose records the investigation is based, was the Dutch pessary, which was used in a total of 71·2 per cent. of cases. The desideratum with this pessary is that the largest size should be fitted which the woman can retain with comfort. Mr. Himes shows that there is much variation in the matter of the size most favoured by the medical officers of the different clinics. These pessaries are made in 14 sizes that range between a diameter of 55 mm. and 87·5 mm. At the Cambridge clinic, the most favoured size—i.e., that with which more women were fitted than with any other size, was one of 67 5 mm. At Glasgow, Wolverhampton, and Cannock, the most favoured size was 77·5 mm. It is far more likely that these wide variations in the most favoured size, amounting to as much as 10 mm., express different standards on the part of the medical officers than different pelvic conformations of the

[1] "Contraception a Common Cause of Disease." London: John Bale, Sons and Danielsson. 1930, 1*s*.
[2] Catholic Medical Guardian, October, 1927, p. 111.
[3] London: Simpkin Marshall and Co. 1927. 1*s*.
[4] Norman Himes: Eugenics Review, October, 1928.
[5] Norman Himes: New England Journal of Medicine, May 1st, 1930, p. 866.

women in the different localities. Indeed, it does not seem impossible that the high percentage of failure shown by Mrs. L. S. Florence to have occurred among the first 300 cases that attended the Cambridge clinic (see THE LANCET, April 16th, 1930, p. 919) may have been attributable to the fact that these women were fitted with pessaries of uniformly too small a size. It is to be noted, however, that though failures could be caused in this way, genital disease could not. There is no evidence in Mrs. Florence's book that the methods taught at the Cambridge clinic caused disease.

THE END-RESULT OF RAMISECTOMY.

THE authoritative pronouncement on p. 127 leaves no hope that the operation of cervical or lumbar ramisection, as performed by Mr. N. D. Royle, is of permanent value in the treatment of spastic weakness. It will be remembered that the operation was devised by the late Prof. J. I. Hunter and Mr. Royle on theoretical grounds for the alleviation of those cases of spastic paraplegia due to an excess of "plastic tone" (Sherrington), but not for those in which the "contractile tone" (Langelaan) alone is responsible for the condition. When Mr. Royle, who works in Sydney, visited London in the summer of 1927 he addressed a meeting of the Section of Orthopædics of the Royal Society of Medicine, showing cinematograph pictures and photos of patients successfully treated by this method. He also visited Queen Mary's Hospital, Carshalton, and selected from a number of children submitted to him six cases likely to benefit from ramisection. These children have been under the care of Mr. Gordon Pugh, medical superintendent of the hospital, who made himself responsible for the supervision of the post-operative care, massage, and re-educative exercises, these being planned on the lines advised by Mr. Royle. These cases have been examined periodically by Dr. C. P. Symonds and by a group of the surgeons who sign jointly the adverse report on their progress which we publish to-day. The names of these surgeons, who include representatives of six of the London teaching hospitals, are sufficient guarantee that impartial and careful consideration has been given to the investigation. Their conclusions will be received with regret.

INFANTILE BERI-BERI.

VERY little is known in Europe about the effect of vitamin-B deficiency during infancy; indeed the text-books seem to dismiss it as of no importance. Some years ago, however, G. W. Bray was able to show that such deficiency was the underlying cause of a huge infantile death-rate among the breast-fed population of a Pacific island, and he gave an excellent account [1] of the clinical features of beri-beri in infants. K. Ohta [2] now reports that the big majority of 430 cases which he has studied at the University Children's clinic in Tokio were in breast-fed infants, and that in more than half of them the symptoms began in the second and third month. In two-thirds of the cases the mothers had suffered from beri-beri either during pregnancy or after the birth of the child, but the severity of the disorder in baby and mother did not run parallel. Various types of infantile beri-beri are recognised. The commonest begins with symptoms very like those of any other gross nutritional disorder — e.g., pallor, loss of weight, inelasticity of the skin, and a fall in the intake of food. Vomiting is an early sign, associated with the passage of green stools, and it was present in 80 per cent. of the Tokio series. It came on usually one to three hours after a feed, and, while actual vomiting was noticed only three or four times a day, regurgitation of food was more frequent. Failure of the circulation was also striking; the pulse-rate may rise to 160, with respirations 40–60 a minute. A notable accentuation of the pulmonary second sound was correlated with marked dilatation of the right side of the heart found at autopsy. In bad cases there was gallop rhythm and sometimes œdema developed. A paralytic type was also encountered in the Tokio series; the paralysis not only affected the limbs but also took the form of oculomotor palsies and ptosis, while laryngeal dysfunction, shown by hoarseness of the cry, was present in 83 per cent. of cases. Sometimes there was retrobulbar neuritis leading to optic atrophy, and sometimes the disease produced meningeal symptoms. Ohta urges that prophylactic treatment of the mother should be the rule, but when a child has actually got beri-beri it should be weaned at once, though one or two breast feeds may, perhaps, be allowed after a few days. With T. Izumita [3] he has investigated the shape and peristaltic movements of the stomach in infantile beri-beri, but found nothing abnormal. It was shown, however, that milk from women with beri-beri remains much longer in the stomach than milk from healthy women, and also longer than cow's milk. This was also true for normal infants and points to a fault in the milk itself. Apparently the delay bears no clear relation to the child's intake of vitamin B.

[1] Trans. Royal Soc. Trop. Med. and Hyg., 1928, xxii., 9.
[2] Jahrbuch. f. Kinderh., 1930, cxxviii., 1.
[3] Ibid., p. 10.

John Farquhar Fulton, M.D. Harvard, M.A., D.Ph. Oxf., Fellow of Magdalen College since 1928, appointed Sterling Professor of Physiology at Yale University Medical School in July, 1929, with a year's leave of absence, is moving to New Haven in August of this year.

THE MANOR HOUSE ORTHOPÆDIC HOSPITAL.—Mr. A. V. Alexander, First Lord of the Admiralty, recently laid one of several foundation-stones of a new wing of this hospital at Golders Green. The wing is part of a scheme that will cost £350,000, and when completed the building will hold 300 patients. The hospital is maintained by the Industrial Orthopædic Society, which has a membership of 160,000 who subscribe a penny a week each. Some 50,000 of the members are employed on the north-east coast; another 25,000 are employees of the London General Omnibus Company.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—At a quarterly court of the directors on July 9th the sum of £2151 was voted in grants. At the present time there are 51 recipients on the books. The sum mentioned above was for the half year July 1st to Dec. 31st. Widows received £37 10s. if over 65 years of age, and £35 if under 65, orphans each received £25. Relief is granted only to the necessitous widows and orphans of deceased members of the society. Any widow of a member who is left with an income of £125 or under is eligible to such relief as the court of directors think fit. Membership is open to any registered medical practitioner who at the time of his election is residing within a 20 mile radius of Charing Cross. The society's address is 11, Chandos-street, Cavendish-square, W.1, and further particulars may be had from the secretary.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCII.—TREATMENT OF DETACHMENT OF THE RETINA.

BEFORE considering the treatment of detachment of the retina it is necessary to deal shortly with the ætiological and pathological aspects of the subject. In the first place it must be realised that the plane of separation at which the retina becomes detached lies between the rods and cones on the one hand and the pigment epithelium on the other. It is not, therefore, strictly speaking a detachment, but rather a cleavage of the retina in an embryonic plane (i.e., the cavity of the primary optic vesicle). This cleavage can be produced in a variety of ways, all of which fall either under the heading of pressure or of traction. That is to say, the retina may either be pushed off by the pressure of something on its choroidal aspect or pulled off by traction from its vitreous surface. It is important to realise these two types since the ætiology, and therefore the treatment and prognosis, is often very different in the two groups. (It is, of course, possible that trauma may act in either direction.)

Detachments Produced by Pressure.

Our first group (of detachments produced by pressure from the choroidal aspect) will be composed principally of cases of new growth or of inflammatory exudate from the choroid. These must be carefully diagnosed from the cases of so-called idiopathic or spontaneous detachment, which fall mostly into the second group, since the treatment and prognosis is much more clear-cut in the first group. It can be stated quite briefly.

1. *New growth.*—The growth is practically always a choroidal sarcoma, and early enucleation of the eye offers the only certain hope of cure. The prognosis for life is good if the eye is removed before extra-ocular extension has occurred. In cases where an only eye with good vision contains a sarcoma it is possible to try the effect of insertion of a radon seed directly into the growth. This has been successful in a certain number of cases.

2. *Inflammatory detachment.*—In these cases the retina is raised up by an albuminous or hæmorrhagic exudate from the choroid. There is no hole in the retina and if the inflammation can be got to subside the retina will in practically every case reattach itself. Rest, heat, either in the form of hot bathings or dry heat (electric pad or Japanese muff warmer), and atropine 1 per cent. to the eye are used in every case, while an attempt should be made to ascertain the underlying cause, which can then be treated by appropriate drugs (e.g., mercury, iodides, salicylates, or tuberculin). The prognosis, except in tuberculous cases, is good. Allied to these cases of inflammation are the cases of detachment of the retina which occur in the course of pregnancy toxæmia and more rarely in other forms of albuminuria. Here no local treatment is required, but treatment of the albuminuria will always lead to reposition of the retina. These cases are therefore the most hopeful of all detachments.

"Spontaneous" Detachments.

The second group of cases forms a marked contrast to the first in that the ætiology is not clear and the prognosis extremely bad. Some text-books even go so far as to give a hopeless prognosis as regards treatment, though all admit that spontaneous recovery has been known to occur in very rare cases. So-called spontaneous detachment of the retina may occur suddenly in a previously healthy eye. It is, however, more common in myopic eyes or in eyes which show evidence of antecedent slight choroiditis. There is often a history of a blow on the head or eye, which may have preceded the detachment by some weeks. The causative factors are not completely understood. Leber's theory appears to fit in with most of the facts. It states that detachment is preceded by degeneration and retraction of the vitreous, which may become unduly adherent to the retina at some point (usually in the situation of a minute patch of anterior choroiditis). Traction at this point by the shrinking vitreous will produce a tear in the retina, through which the fluid portion of the degenerate vitreous may reach the subretinal space and distend it. This theory fits in with the observed facts that small patches of choroiditis are common in eyes with detachment, that rents and holes in the retina can be found in practically every case of spontaneous detachment if carefully looked for, that they are often triangular in shape, are situated anteriorly, and are more common in the upper part of the retina, where most detachments start.

Treatment should be carried out in every case in which the detachment has existed for less than a year. The best results are obtained in recent detachments (up to four months), since the retina ultimately loses its function and even if reattached is of no use. Treatment can be divided into non-operative and operative. Most ophthalmic surgeons would prefer to commence with non-operative measures, since if these fail, operation can be undertaken later. It is, however, important not to waste too much time, especially since the success in a number of cases of the operative procedure described under (4) is now undeniable.

Non-operative Measures.

The patient must be kept in bed absolutely at rest with the head between sandbags in such a position that the detached area occupies the lowest position in the eye. This mode of treatment is therefore likely to show the best results when the detachment is in the upper part. The patient should be kept absolutely still for 6–8 weeks if the treatment is carried out to the full. In addition to absolute rest attempts are made to promote absorption of the subretinal fluid, by sweating (aided by injections of pilocarpine gr. 1/12 and hot air baths) by mercurial inunctions, by administration of iodides and purgatives, and by the application of a pressure bandage to the eye, though it is difficult to see how this last is supposed to act. Locally the eye is kept at rest with atropine, and dionin drops may also be used in increasing strengths beginning at 1 per cent., to increase the lymphatic drainage. The treatment is obviously very trying to the patient and should never be used on old people. In a certain number of cases improvement takes place but there is practically always a relapse later.

Operative Measures.

Operative treatment includes procedures designed: (1) to promote absorption of the subretinal fluid; (2) to let out the subretinal fluid; (3) to promote adhesions between the retina and choroid; and (4) to close the hole in the retina.

1. Subconjunctival injections are made, usually with hypertonic saline (4–8 per cent.) after cocainising the eye. They are made with a hypodermic needle as far back as possible over the site of the detachment. They are apt to be very painful and seldom appear to do much good. Mercury oxycyanide may be used instead of salt solution.

2. Most detachments start at the top, but the effect of gravity causes the fluid to collect at the bottom of the eye so that the originally detached portion usually becomes reapplied. The fluid in the lower part can be then let out by various means. The sclera can be punctured by means of a Graefe knife, or the fluid may be aspirated. Some operators make the puncture with a galvano-cautery and aspirate through the hole, others sear the surface of the sclera before puncturing, in order to promote a reaction in the choroid which should then adhere to the retina. Opinion is still divided as to whether the retina should be transfixed with the knife in making the puncture. Some observers advocate this, but most consider that the sclera and choroid alone should be cut. It is also possible to evacuate the fluid by making a trephine hole in the sclera over the site of maximum detachment. All these procedures may lead to improvement but relapse is common.

3. Adhesions between retina and choroid are produced by cauterisation, either by the Paquelin or the galvano-cautery. The former is preferable as it retains its heat better. The outside of the sclera alone may be cauterised or a puncture may be made. From time to time observers have attempted to produce a chemical inflammation by injection of irritants into the subretinal space or into the vitreous, but this method is dangerous and, usually leading to severe reaction, has been abandoned. Attempts have also been made to promote reposition of the retina by dividing any abnormal vitreous bands which may be present (Deutshmann's operation), but the technique of this is difficult and only applicable in certain cases.

4. If Leber's theory of causation is correct and the tear in the retina precedes the detachment, it would be rational to suppose that if the hole were closed the subretinal fluid might absorb, since we know that it does so in albuminuric detachments in which there is no hole. Gonin, of Lausanne, was led to this conclusion after working on the pathology of spontaneous detachment. He devised the operation which bears his name with this end in view, and the results are hopeful in suitable cases. Patients have remained cured since 1916, when the operation first came into use in Switzerland, and the method is steadily gaining ground, and is now universally recognised as of value. The procedure consists briefly in finding the hole ophthalmoscopically, in localising its position on the outside of the eye by ophthalmoscopic and external measurement, and, after reflection of the conjunctiva, perforating the sclera with a very fine Paquelin cautery as near the hole as possible. The subretinal fluid flows out and the area of retina containing the hole comes in contact with the area of choroidal reaction following the burn, and is firmly tacked down by the resulting scar. The results are good in cases where detachment with a single hole is present in an otherwise apparently healthy eye, some cases having remained cured for more than ten years. The results are naturally worse if the hole is very large or the eye degenerate, but if the first operation fails to seal the hole completely a second or even a third puncture can be made after an interval of about ten days. There is usually remarkably little reaction if the cautery is used as hot as possible. The method is deserving of wider use, since it has undoubtedly produced permanent cures of an extremely serious condition.

IDA MANN, D.Sc., M.B. Lond., F.R.C.S. Eng.,
Assistant Surgeon, Royal London Ophthalmic (Moorfields) Hospital; Ophthalmic Surgeon, Royal Free Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. F. J. Gowans joins the staff at Haslar Hospital, in succession to Surg. Capt. A. McCloy, who resumes duty in the hospital ship *Maine*.

The following appointments have been made:—

Surg. Comdrs. R. N. W. W. Biddulph to *Victory XI.*, for H.M. Dockyard, Portland; G. E. D. Ellis to *Iron Duke;* and H. L. Douglas to *Victory*, for R.N. Barracks.

Surg. Lt.-Comdr. J. H. B. Crosbie to *Pembroke* for R.N. Barracks.

Surg. Lts. W. R. S. Panckridge to *Scarborough* and D. M. Beaton to *Danae*, on commg.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. (D.) A G. D. Pridham to *Vivid*, for R.N. Barracks.

ROYAL ARMY MEDICAL CORPS.

Col. H. S. Roch, late R.A.M.C., is placed on half pay.

Lt.-Col. W. W. Browne, from R.A.M.C., to be Col.

Maj. H. J. Bensted, R.A.M.C., is appointed an Asst. Professor at the R.A. Med. Coll.

Maj. (temp. Lt.-Col.) A. C. Amy to be Lt.-Col., vice Lt.-Col. W. W. Browne.

Maj. R. W. D. Leslie to be temp. Lt.-Col.

ARMY DENTAL CORPS.

Capts. D. J. Isaac and H. O. Sumerling to be Majs.

ARMY PROMOTIONS.

The results of the examination for promotion of officers in the Regular Army, Indian Army, and Dominion Forces, held at stations abroad last March, are as follows:—

Royal Army Medical Corps.—Majs. S. J. A. H. Walshe, R. R. Thompson, W. McE. Snodgrass, and W. M. Cameron; Capt. K. Fletcher-Barrett; Lts. M. R. Burke, J. H. Anderson, D. B. O'Sullivan-Beare, P. J. L. Capon, H. W. Daukes, and A. T. H. Marsden.

Army Dental Corps.—Capts. F. F. Anslow and R. G. Law.

Indian Medical Service.—Lt. B. N. Hajra.

Royal Canadian Army Medical Corps.—H. M. Cameron.

In India the results are:—

Royal Army Medical Corps.—Majs. G. O. F. Alley, J. Bennet, H. B. F. Dixon, P. A. Opie, and D. C. Scott; Capts. C. W. Greenway and C. Russell; Lts. G. T. L. Archer, D. R. W. Burbury, De L. Carey, F. M. Collins, W. F. Cooper, C. L. Day, P. Dwyer, W. G. S. Foster, R. A. M. Humphrey, W. F. Lane, L. R. S. MacFarlane, S. R. M. Mackay, A. MacMillan, T. E. Moles, F. Mc. L. Richardson, W. R. C. Spicer, M. G. de L'I Sturm, J. E. Swyer, R. T. P. Tweedy, G. A. Walmsley, and T. F. M. Woods.

Army Dental Corps.—Capt. J. McCurdy.

Indian Medical Service.—Lts. (Prov. Capts.) M. L. Ahauja, C. A. Bozman, C. K. Lakshmanan, W. J. L. Neal, and T. C. Ramchandani; Lts. R. D. Alexander, K. F. Alford, E. A. R. Ardeshir, S. C. Bakhle, H. L. Batra, S. S. Bhatnagar, B. Chaudhuri, E. V. Claydon, C. F. J. Cropper, S. T. Davies, Lakshman Dass, J. P. J. Little, E. S. S. Lucas, S. M. K. Mallick, C. Mani, and A. V. O'Brien.

DEATHS IN THE SERVICES.

Col. George James Hamilton Bell, C.I.E., I.M.S., who died on July 19th in his seventieth year, was the son of the late Mr. Robert Bell, advocate, and was educated at Edinburgh Academy and at the University, where he graduated M.B., C.M., in 1882. Four years later he joined the Indian Medical Service and served with the Burmese Expedition from 1887 to 1889 (medal and clasp), and with the Lushai Expedition on the N.E. frontier which followed. Later he acted as civil surgeon in Bengal, and in 1892 returned to Burma as superintendent of gaols. In 1910 he became Inspector-General of Prisons. His work in this department was recognised by the award of the C.I.E. in 1914. Two years later he was made Inspector-General of Civil Hospitals in Bihar and Orissa, in which capacity he acted until he retired in 1920. Col. Bell married, in 1890, Violet Helen Mary, daughter of Mr. Lestock Reid Forbes, by whom he had a son and two daughters.

SPECIAL ARTICLES

CHRONIC OTORRHŒA IN SCHOOLS.

A PROBLEM OF ORGANISATION.

BY A. R. FRIEL, M.D. DUB., F.R.C.S. IREL.

SEVERAL clinics for otorrhœa have of late years been set up in connexion with the school medical service. One or more sessions of two and a half hours' duration are held at each weekly. It has been found that one session employing the methods described below is sufficient for the cases occurring in Tottenham—one of the outer districts of London in which the school population is 25,000.

The object of this paper is to show that it is necessary to consider not only the condition in each patient and the treatment suitable for this, but also to pay attention to organisation so as to ensure adequate treatment for considerable numbers, and thus abolish chronic otorrhœa from the elementary schools.

As this paper does not deal specially with the treatment that can be carried out in the clinic, this is only shortly described.

Treatment.

The *acute* cases are given glycerin with 1 per cent. of carbolic acid to use at home. The mother is asked to place the child flat on its side and pour a teaspoonful of the fluid into the ear and allow it to soak in for 10, 15, or 20 minutes by the clock once or twice daily, according to the severity of the case. When the discharge becomes distinctly less the glycerin is suspended, and boric powder is blown into the ear at the clinic once a week till the ear is dry. Very occasionally zinc ionisation is required. Many cases of acute suppurative otitis media show rhinitis. For this they receive diastolisation, the most valuable and generally applicable method of treatment for simple rhinitis known to me. Directions for its use in this as well as some other conditions can be found in the papers [1] [2] referred to below. The *chronic* cases are with rare exceptions given no home treatment, but are treated once a week or once a fortnight at the clinic. In many the disease is slight and recovers with one careful cleansing and the insufflation of boric powder. Cases of greater severity are given zinc ionisation. Boric powder is also useful here in absorbing any mucus poured out while the inflammation is subsiding. A certain number of mastoid cases in which the discharge is mucoid recover at the clinic. When the discharge from the antrum is purulent I believe that an operation is necessary. These need not attend the clinic again. When more than the one factor—sepsis—is responsible for keeping up suppuration in the ear, the additional factors, such as polypi, are treated first. When the septic area is difficult of access, though not totally inaccessible from the meatus, a special technique is used to make it accessible or to gain access to it. These are the cases which take so much trouble.

[1] Gautier, F. G.: Presse Méd., 1924, p. 139.
[2] Clarke, F. P. M.: Clin. Med. and Surg., September, 1929; January, 1930.

Organisation.

Organisation—that is, the arrangements for getting work done—aims at securing the maximum of results with the minimum of energy, time, and material. It seeks to eliminate waste. It is intimately concerned with details. For example, when a mother brings her child to the clinic her work at home is at a standstill. If we do not keep her waiting we are more likely to secure her help and the regular attendance of the child. A written appointment is therefore given to each patient, and they are seen in their order in the appointment book. This avoids congestion, hurry, and irritation, and also insufficiency of treatment.

When a clinic of this sort is started in a district, the first difficulty which is met is the accumulation of patients. This is dealt with by calling them up seriatim in such numbers as experience shows can be dealt with at a session, diagnosing in each case what is keeping up the suppuration, and deciding whether the causal factors can be treated in the clinic or whether a mastoid operation is needed. The accumulation is worked through and it is then possible to start treating every fresh case of otorrhœa as soon as it occurs, and so prevent the great majority from becoming chronic. After three years it was found

TABLE I.—TOTTENHAM EDUCATION COMMITTEE: REPORT ON CASES TREATED AT AURAL CLINIC, 1924–29.

Nature of disease.	Cases. (ears).	Cured.	Ceased to attend.*	Still under treatment.	Needing operation.	Cured cases.			
						Visits made till discharge ceased.		Cases which had—	
						Total.	Aver.	Ionisation.	Recurrences.†
1. Acute suppurative otitis media	261	224	26	5	6	393	1·74	14	11
2. Chronic suppurative otitis media due to :—									
(a) Tympanic conditions—									
(1) Tympanic sepsis	229	208	21	—	—	383	1·7	87	35
(2) ditto and granulations	44	35	9	—	—	121	3	24	2
(3) ditto and polypus	35	24	7	—	4	103	3	15	4
(b) Tympanic conditions and—									
(1) Rhinitis	18	14	2	2	—	47	2·6	6	4
(2) Polypus in nose	1	—	—	—	1	—	—	—	—
(3) Pyorrhœa	2	2	—	—	—	18	9	2	—
(4) Inflamed tonsils	1	1	—	—	—	2	2	—	1
(5) Adenoids	1	1	—	—	—	1	1	—	—
(6) Attic disease	56	21	25	3	7	113	5·5	13	3
(7) Mastoid disease	86	18	20	2	46	72	4	11	3
3. External otitis	73	62	11	—	—	179	3	7	3
4. Not diagnosed and other conditions	32	18	12	2	—	32	2	5	1
Totals	839	628	133	14	64	—	—	—	—

* Of the cases shown as "ceased to attend" a proportion had left school at 14 years of age, or had removed from the district.
† The numbers were the ears which are known to have had one or more fresh attacks of otorrhœa.

that (omitting those cases due to mastoid disease), the number of chronic cases which could be detected in the schools at Tottenham was almost nil. Experience at the Hornsey and Walthamstow school aural clinics confirms the experience at Tottenham.

The organisation consists in bringing to each session only such numbers as can be efficiently treated, arranging that these are spaced out over the time so that haste is not necessary, and also that the time of the patient and his relations is not wasted. Recovery without damage to the hearing depends upon the possibility of getting the patients at the period when disease is most amenable to treatment. The elimination of the chronic cases renders this possible.

Table I. is an analysis of the nature of the disease, a statement of the frequency of the conditions met, and a summary of results. In the cured cases the average number of visits till the discharge ceased and the number of ears which had ionisation and also the number of recurrences are stated. In the column marked "ceased to attend" in Table I., some of the easy cases ceased to attend because the parent considered the child well and attendance unnecessary. On the other hand, in difficult cases—e.g., attic disease—they stopped coming because they saw no improvement. I have much sympathy with the latter. Before sending a child for an operation there should be a strong probability that he will leave the hospital with a dry ear and the hearing not made worse. Unfortunately in many districts this is not assured.

"Recurrences," or rather reinfections, in young children, are usually due to attacks of rhinitis, and in older children to water entering the ear in bathing, swimming, or washing the head. Many of these cases return to the clinic of their own accord and usually recover rapidly without ionisation.

TABLES II. AND III.

	1926.	1929.
Average number of cases seen per session ..	18·9	25
Average total time per case spent at clinic .	20·9 m.	16·9 m.
Average time per case kept waiting before seeing aurist	7·5 m.	5 m.

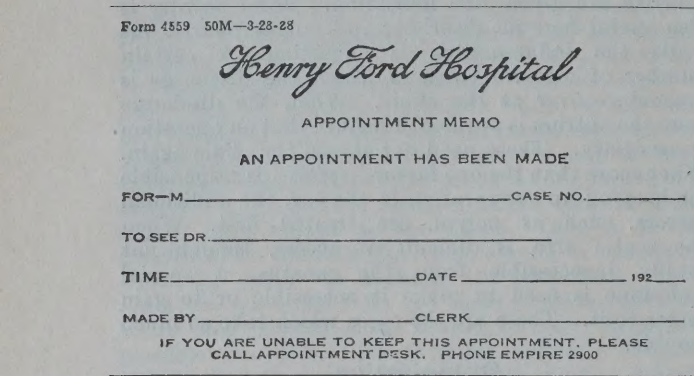
m. = minutes.

N.B.—In 1926, 15 per cent. of the cases seen were in the acute stage; in 1929, 45 per cent. of the cases were in the acute stage, and there were very few difficult "chronic" cases.

Tables II. and III. are compiled by Mr. Cohen, the organising clerk, for separate periods of six months.

HENRY FORD HOSPITAL.

In Detroit I had an opportunity of visiting Henry Ford Hospital, where a system of appointments is adopted (see figures), and I did not see any waiting-hall. It is evident that avoidance of waste of time, energy, and material makes for progress in clinical research, and that if we do not pay attention to this we shall remain in the slough of an accumulation of people who are sick. In a laboratory, experiments are arranged to solve single problems, but in a clinic, solutions are sought in a mixture of problems in living patients. This mixture is there analysed and the reaction of the tissues to the treatment studied.



Form 4559 50M—3-28-28

Henry Ford Hospital

APPOINTMENT MEMO

AN APPOINTMENT HAS BEEN MADE

FOR—M_____ CASE NO._____

TO SEE DR._____

TIME_____ DATE_____ 192____

MADE BY_____ CLERK_____

IF YOU ARE UNABLE TO KEEP THIS APPOINTMENT, PLEASE CALL APPOINTMENT DESK. PHONE EMPIRE 2900

IMPORTANT INFORMATION FOR PATIENTS WITHOUT APPOINTMENT

PATIENTS WHO DO NOT MAKE ADVANCE APPOINTMENT TO SEE A DOCTOR WILL BE REQUIRED TO WAIT UNTIL THEIR HISTORY IS OBTAINED FOR THE DOCTOR AND UNTIL OTHER PATIENTS WHO HAVE MADE ADVANCE APPOINTMENT ARE PROPERLY TAKEN CARE OF. ADVANCE APPOINTMENT CAN BE SECURED AT THE APPOINTMENT DESK OR BY CALLING

EMPIRE 2900

BETWEEN 8:00 A.M.—6:00 P.M. DAILY EXCEPT SUNDAYS AND HOLIDAYS

The Best Policy.

To sum up, the basic factor in the recovery of a patient is the treatment he receives; if we have a good treatment for any particular disease, we have a chance of abolishing the disease. But organisation is necessary to make this economically possible. There is now a great deal of unemployment and poverty. The medical profession may contribute something to the solution of the country's economic problems by seeing to it that there is no waste of energy, time, or material in the organisation of treatment.

I am convinced, basing my conviction on the sure ground of experience, that by the adoption of a correct policy, by paying special attention to organisation, and by adopting treatments which have proved to be rapidly successful, the abolition of chronic otorrhœa from the elementary schools is a practicable proposition.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

JAMAICA GINGER MULTIPLE NEURITIS.

A FEW months ago the newspapers were filled with stories of a strange epidemic of paralysis that had smitten the population of Oklahoma. Gradually it was revealed that a large proportion of the victims, ultimately as many as 95 per cent., could be brought to confess to the drinking of Jamaica ginger or "Jake," as it is sometimes affectionately called. The habit of drinking Jamaica ginger is not new in Oklahoma, large quantities have been consumed without alcoholic neuritis resulting, but in these days alcohol may be other things beside ethyl hydroxide. Some of the Jake victims apparently had taken very small quantities, and it is significant that the outbreak should have been so strictly limited in time. The medical aspects of this outbreak were discussed at the recent meeting of the Oklahoma State Medical Society. Neurological examination of the cases had revealed: (1) Steppage gait; (2) positive Romberg test; (3) absent Achilles reflex; (4) bilateral foot drop; (5) diminished vibratory sensation in both legs; (6) absent vibratory

sense perception in toes; (7) marked tenderness of the affected motor nerves; (8) pain, tactile and temperature perception unaltered. All attempts to isolate the toxic factor thus far have failed. Lead has been suspected, but no gastro-intestinal symptoms or other concomitant signs of lead poisoning have been present. Faradic response of the muscles was lost early, galvanic response is altered both quantitatively and qualitatively. An autopsy on one of the patients who died (not from the neuritis) showed on section of the medulla-cord slight œdema and thickening of the meninges. A perineural exudate, consisting mostly of lymphocytes, was found in a section of the cauda equina. Section of the anterior tibial nerve showed great thickening of the perineurium. Subsequent work showed degeneration of the anterior horn cells of the spinal cord. Invalidism seems to last at least for several months. The final outcome is still uncertain.

PREVENTION OF TRAFFIC ACCIDENTS.

For the prevention of traffic accidents the Federal Bureau of Home Economics has suggested that children be dressed in bright colours. The American Automobile Association, noting this suggestion, has presented 2000 yellow rubber rain capes and hats to schoolboys helping to control traffic in Washington, D.C. According to the *United States Daily*, the loss of life from traffic accidents for last year amounted to not less than 31,000, which is an increase of 10 per cent. over the deaths from this cause in 1928, and an increase of 147 per cent. over the figure for 1920.

NATIONAL INSTITUTE OF HEALTH.

Both houses of Congress have passed an Act, which the President has now signed, establishing a National Institute of Health. An initial appropriation of $750,000 is made for the construction and equipment of buildings. The Secretary of the Treasury is authorised to accept donations for use in ascertaining the cause, prevention, and cure of diseases affecting human beings. Research fellowships will be available for work within the institute, and subsidies will be granted for research both in this country and abroad. According to Senator Rausdell, author of the Bill, the encouragement and subsidising of research is the most important function of the institute.

An important pronouncement in connexion with the use of the radio to promote fraudulent "remedies" is made by Mr. W. E. Humphrey, a member of the Federal Radio Commission. "Publishers, advertising agencies and the radio stations hereafter must be prepared to defend any advertisements they handle," he says. The Commission will make the radio station parties in all actions brought against the advertisers. He appeals to physicians to aid the Commission, which has few funds at its disposal, by giving expert testimony whenever this may be necessary to convict an advertiser of fraud.

The control of medical work in the Federal prisons has been turned over to the U.S. Public Health Service, at the request of the Attorney-General. This is part of a general tendency to coördinate the different medical services of the Federal Government, and it should result in much needed improvement of the medical work in Federal prisons.

KING GEORGE HOSPITAL.—The six foundation-stones of the new buildings were laid recently by the Lord Mayor of London, the Lord-Lieutenant of Essex, Sir Cecil Levita, chairman of the London County Council, 1928-29, the Mayor of Ilford, and the Chairmen of the Urban District Councils of Barking Town and Dagenham.

BRITISH EMPIRE CANCER CAMPAIGN.

SEVENTH ANNUAL REPORT.

IN presenting their seventh annual report the Grand Council of the British Empire Cancer Campaign indicate the development of their organisation from small beginnings. There is now a headquarters staff, an intelligence department, and a system of coördination by which duplication and waste of effort is reduced to the smallest possible proportions.

The investigations subsidised cover a wide range and include experiments on the artificial production of cancer, tissue culture, studies of the biochemistry and metabolism of malignant tumours, and of methods of treatment. Chemotherapy by the heavy metals is being tried out under various conditions at some centres, and X ray therapy at others, but mostly there is concentration on perfecting their technique of treatment with radium. "The progress accomplished in the past year is indicated in the extension of radium therapy to new types of cases, in the modification of technique, in application of fresh methods of radiation." This statement, quoted from Mr. Stanford Cade's report on work at the Westminster Hospital, would apply equally well to other centres where radium is being used, and is true for clinics which have only recently started this form of treatment, as well as for those whose experience of it now extends over several years.

The bulk of the report, as in previous years, is taken up by records of work carried out at various centres. These are compiled by the institutions and individuals in receipt of grants, and it is made clear that the various committees of the campaign assume no scientific responsibility for the statements of fact or opinions contained in them. Unfortunately, however, in the foreword, signed by Lord Reading, which precedes these accounts, no indication is given where in the text fuller details can be obtained of the results quoted. For example, the following paragraphs in the foreword (p. 13) suggest that the difficulty of obtaining a supply of animals afflicted by spontaneous tumours has been surmounted.

The passage states:

"A strain of mice, some 94 per cent. of the females of which develop mammary cancers, has been obtained from America, through the kindness of Dr. Burton Simpson, of Buffalo, who obtained it by inbreeding from tumour-bearing parents for some 30 to 40 generations. In November, 1928, six females and three males of this strain reached England. They have been bred with great care and their progeny now numbers about 1000. Of the original six females one died of pneumonia; the other five have now all developed spontaneous cancers. These cancers grow rather slowly, but they go on growing and always cause death in about three to four months, producing meanwhile secondary growths exactly in the manner of cancerous tumours in man.

"It is too early as yet to say whether or not 'auto-vaccination' will prove effective in the case of these spontaneous tumours; indeed, a year or longer may be required in order to determine the point. There is, however, some hope of success. If the results obtained seem to justify the step, treatment of human cases will be undertaken at the earliest moment."

These statements seem to imply a general agreement among the workers, but are, in fact, abridged from the report by Dr. T. Lumsden of his personal work, experience, and hopes. The disappointing experience of this same strain of tumour-bearing mice recorded in the report from the Cancer Hospital, London (p. 26), is not chronicled.

"We were fortunate in obtaining from America, by the kindness of Dr. Simpson, of Buffalo, a strain of mice in which the females develope spontaneously mammary

carcinoma in about 90 per cent. of the cases. We have closely inbred this strain, but in a period of over 18 months not a single case of carcinoma has developed. It is true that the inbreeding has decreased the fertility, but it has not accentuated the supposed inherent disposition to cancer. . . . An attempt was made by repeated trauma of the mammary gland in some of the females to call forth the supposed inherited predisposition, but no response was elicited." In commenting on these negative results the workers at the Cancer Hospital state only that it would be unwise so soon to conclude that the tumours found in the strain in Buffalo are not attributable to hereditary disposition but to some exogenic factor.

It would thus be unwise to assume, as the format suggests, that the foreword represents a sort of bird's-eye view of the general conclusions reached, the compilation of which would admittedly be a hard, if not an impossible, task. Any misapprehension could be avoided in future reports either by the insertion of page numbers, indicating where in the report any work summarised is described, or by the addition of a good index.

We select for notice the searching work being carried out in various centres on

Carcinogenic Agents.

At the Cancer Hospital Research Institute the theory that any sort of chronic irritation of the tissues might predispose to the development of cancer, and that the main determining factor is the personal susceptibility, is not accepted.

The experience of Prof. A. Leitch and his colleagues has been that of substances closely allied chemically and physically some may induce neoplasia and others not, and they can discover no reason for this. It is only by trial of substances in the animal body that cancer-producing agents can be distinguished. In certain industries, such as briquette making and mineral oil refining, it is found that the noxious substances, pitch and crude oil respectively, are apt to induce epitheliomata in the workmen, whilst on the other hand chrome workers, for example, who are exposed to much more irritating substances that cause ulcerations, do not develop epithelioma in these exposed parts. Recently a deliberate test of potassium bichromate was made in a large series of mice, and though superficial and chronic ulcerations were produced in almost every case no tumour formation was seen.

It was discovered that several of the distillation products that produced cancer experimentally gave a very characteristic fluorescence spectrum, and that inactive substances did not exhibit this phenomenon. When a beam of ultraviolet light is thrown on a suitable solution of these active substances the photographic plate shows characteristic bands. This method has proved useful in giving a preliminary indication of what afterwards proved in test to be cancer-producing substances.

Attempts to induce cancer in mice by the application of the tar produced by tobacco smoking have been made at the Cancer Hospital, London, and also at Birmingham, without success.

CHEMICAL NATURE OF CARCINOGENIC SUBSTANCES.

Dr. F. D. M. Hocking (Westminster Hospital) notes that these carcinogenic substances are widely diverse as regards their chemical nature, but possess the one property in common of being fat soluble. He compares the list of substances known to give rise to cancer with one of drugs which act particularly upon the liver and result in hepatic degeneration. Such a list would include alcohol, chloroform, chloral, picric acid, T.N.T., arsenic, phosphorus, antimony, morphine, &c., all of which also have the common property of being fat soluble.

Dr. Hocking has tried to find out whether or not a precancerous toxæmia with some fat-soluble toxin which would attack the liver could be established. He states that in nearly every case of cancer, even when seen very early in the disease, the hepatic detoxicating functions are not only deficient, but are entirely absent, and makes the suggestion that cancer is caused by a fat-soluble toxin being present in the body for a very considerable period, perhaps for years ; for some time this toxin may be destroyed by the liver, but later hepatic degeneration (generally fatty degeneration) will ensue, and a state will be reached at which hepatic detoxicating action has been lost and free toxin is present in the body ready to attack some other tissue—i.e., at the precancerous state. It is further suggested that cancer is a degeneration, brought about in a manner exactly similar to that of any of the other better known forms of degeneration, by the action of a specific toxin, and that cancer cells, instead of being particularly virile, are, in fact, already on their way to death and can be killed outright by increasing the degree of toxæmia.

Dr. Hocking gives arguments to support this theory, and uses it to explain the success of treatment by radium.

It is well known, he says, that phospholipin, cholesterol emulsions or combinations enter largely into the composition of cellular membranes, and it is probable that they also form partitions within the cells themselves, thus physically shutting off one portion from another. Now, the interface between two physically immiscible bodies (such as fats and water in this instance) is always the seat of an electrical charge, so that such a static charge must reside on the surfaces of the phospholipin-cholesterol particles within the cell. If this charge is altered or neutralised cellular equilibrium is upset, particularly with regard to fat metabolism, and such a change is associated with malignant degeneration. As one of the characteristic properties of radium is to neutralise such static charges, it follows that irradiation of a normal tissue with radium will result in malignant degeneration if the dose is mild, and in death of the cells if it is severe. Irradiation of already degenerated cells—i.e., cancer cells—will therefore result in their complete destruction without influencing the normal surrounding tissues, always provided that these do not receive enough irradiation to cause their malignant degeneration.

According to this theory it is to the determination of the optimum intensity and extensity of radium irradiation that attention should be directed in the near future.

PHYSICAL PROPERTIES.

Mr. J. J. M. Shaw, working at the Department of Surgery in the University of Edinburgh, has carried out a series of observations on a large number of mice in order to determine the importance of the physical properties of the carcinogenic compounds in external applications.

A group of irritants, salts, acids, and alkalis, which are water-soluble and capable of dilution and removal by the tissue fluids, was contrasted with a group of viscous substances, tars, oils, &c., which are insoluble in the tissue fluids but which are capable of permeating the cellular strata and of holding the toxic moiety in prolonged contact with the cells in which the surface tension is also affected.

Papillomatosis and epitheliomata have been produced only by the latter group possessing the qualities of viscosity, insolubility in tissue fluids, and toxicity, and the indications have been that the specificity of carcinogenesis may lie in this physico-chemical complex and not in the nature of the toxic moiety which may be variable.

Whereas at the Cancer Hospital, London, attempts to induce cancer by applications of solid carbon dioxide merely produced, in 13 oz. of mice, papillomata which subsequently disappeared, Dr. I. Berenblum, working at Leeds, includes carbon dioxide among the "agents capable of inducing cancer." His experiments suggest that when two agents capable of inducing cancer are applied concurrently to the same area of skin the result may not be an augmentation of carcinogenesis but an inhibition. When each agent is applied alone for a certain period a summation of effect may be produced. The work in progress at Leeds on the anticarcinogenic action of dichloroethyl sulphide (mustard gas) has been

confirmed by the repetition of previous experiments and by further investigations.

Certain experiments devised to seek an explanation of this reputed inability of blast-furnace tar to produce tumours yielded conclusive evidence that samples of this tar are quite capable of giving rise to cancer under suitable conditions, though it is not so active as the horizontal retort gas tar.

INHIBITORS AND ACCELERATORS OF CARCINOGENESIS.

At Sheffield Prof. E. Mellanby and Dr. A. F. Watson have studied the effects of diet and other factors on the initiation and growth of cancerous tumours. Groups of mice have been maintained on varying types of diet and under different experimental conditions in each case for about 12 months, and the effect on the development of tar tumours has been studied. Care had to be taken to ensure that any inhibiting effect of a particular diet on the growth of the tumours was not producing its inhibition by adversely influencing the general health of the animals. The main results are not yet ready for publication.

One fact which is thought to have emerged from these experiments is that the development of tar tumours in mice depends on the ease of access of the tar to the reacting skin cells. It would seem probable that under ordinary conditions the tar makes use of its solubility in the skin fats to gain access to the reacting cells. If this fat is experimentally increased, for instance, by applying the same type of fatty substance obtained from other mice to the skin before applying the tar, then the cancerous reaction is strikingly increased. A similar, but somewhat less marked, effect is produced if olive oil is applied to the skin instead of the animal fatty extracts before the treatment with tar. Another method of accelerating the cancerous reaction in tarred mice is by maintaining the animals on a diet containing a high proportion, 20–25 per cent., of butter. Under these conditions the skin and hair of the mice assume a characteristic greasy appearance, and, presumably by facilitating the periodical absorption of the tar, the numbers of tumours produced are definitely increased. It might be anticipated that if the superficial skin fat is removed, either completely or partially, then the opposite effect—the inhibition of the cancerous reaction—would be found. That under certain conditions this is the case has been shown by treating the skin of the animals with petroleum ether—a typical fat solvent—before the applications of tar.

An interesting extension of these observations is that the increase or removal of the superficial skin fat not only increases or reduces respectively the skin tumours in tarred mice, but that a similar effect is produced on the tumours found in the lungs. Some of these are secondary to the skin tumours and some are of an adenomatous nature and usually regarded as primary lung tumours. In both cases, however, squamous secondary growths and epitheliomata, increase and reduction of the primary skin tumours, resulting from the treatment described above, result in a corresponding increase or decrease in the numbers and frequently the size of the lung tumours.

Dr. Harold Burrows has investigated further the possibility of introducing colouring and other matters into the cells of living tumours. He finds that permeation of the walls of the blood-vessels by colloid and particulate matters appears to be an early accompaniment of every method which produces cancer artificially (tar, X rays, ultra-violet light, irritation by cysticercus). It is, of course, a constant feature of local irritation whether this leads to cancer or not. But there are other conditions than inflammation in which such permeation occurs, and it may play an important part in those changes which lead to cancer. Dr. Burrows gives reasons for suggesting that the main mechanism of malignant metastasis is identical with the process of disposal of other fine particulate matter which gains an entrance to the blood or the lymphatic stream.

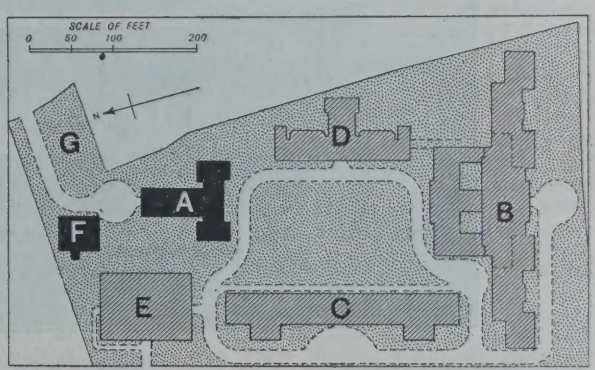
QUEEN CHARLOTTE'S HOSPITAL.

OPENING OF THE NEW ISOLATION BLOCK.

On July 10th Princess Mary, Countess of Harewood, opened the isolation block which is the first section to be erected of the new hospital in the Goldhawk-road, Hammersmith, to which the work of Queen Charlotte's Maternity Hospital will eventually be transferred. When completed the new Queen Charlotte's will be the largest maternity hospital in the Empire. It will eventually comprise the main hospital buildings, four storeys high, consisting of two 100-bed units and 48 prenatal beds (an annexe at the rear will contain the staff dining-rooms), the paying patients' block of five storeys with 80–100 beds, the administration block, students' college, and nurses' home, also of five storeys, the out-patients' block, antenatal and infant welfare department, the isolation block, containing beds for 30 patients and nurseries for 30 infants (now open), the research laboratories (now building), and the boiler house.

The whole of these buildings, which will accommodate 358–378 in-patients, will be grouped round a central lawn, according to the plan shown in Fig. 1, and are so planned that all wards look out on green trees and grass.

FIG. 1.



A = isolation block. B = main block. C = administration block, students' college and nurses' home. D = paying patients' block. E = out-patients' block. F = boiler house. G = site for laboratory. A and F only are now complete.

The Isolation Block.

The isolation block will be used for septic cases, and will be ready to receive patients in a few weeks. Sir Almroth Wright, who spoke at the opening ceremony, said that the building would be devoted to the study of puerperal sepsis. The deaths of mothers from this cause were not decreasing in number. The resources hitherto available had not been successful in coping with puerperal sepsis, and new ones would have to be looked for if what Sir Almroth described as one of the greatest problems of the world to-day was to be solved.

The isolation block has been laid out by the architects, Messrs. Edwin T. and E. Stanley Hall, in the form of a "T," of which the top faces due south, the leg running north and south. The top consists of three storeys, each floor having one five-bed ward, five single-bed wards (of which two are for paying patients), and a nursery for ten infants. The leg, which is only two storeys high, has a central corridor,

from which various offices open to right and left, whilst the first floor corridor is expanded at the north end to the octagonal lobby of the operating theatre.

On the ground floor are rooms for the honorary staff and for the resident medical officers, and also the dispensary, waiting-room for patients' friends, the receiving-room, nurses' duty room, and ward kitchen. This floor is connected by a covered way with the temporary nurses' home, situated in an adapted villa on a site which will later be occupied by the out-patients' and antenatal department. On each floor the five-bed wards have French windows opening on to broad teak balconies on the south side, on to which the patients can be wheeled in their beds. The single-bed wards face south, and all beds have the necessary connexions for a bed lamp, a bell, and the wireless. An observation window in the door of the single-bed wards, closed by a bronze disc, enables the nurse on duty to keep an eye on her patient. The nurseries are at the east end of the building.

Each of the three floors contains a duty room for the nurses and a ward kitchen, the latter giving on to a space provided for an electric service lift to link up the ward kitchens on each floor. All the corridors are lined with pale buff tiles to a height of 5 feet and the walls and ceilings throughout are treated in buff. All corners are rounded off, and all doors are in polished teak. The door and other fittings throughout are in roanoid, which only requires wiping, and is acid- and fire-proof. Taps, bed-pan racks, and other fittings are chromium-plated. All the paintwork is cellulose, brushed on to provide a good finish.

Sterilisers and Laundry.—The sterilising equipment is ample. On each floor is a room for sterilising the mackintosh bed sheets, a provision which is a new departure in hospital planning. The sink rooms for dealing with the bed pans have a sink fitted with a jet and douche over which the pan can be inverted. A large steam steriliser completes the work, and the bed pans are then transferred to a chromium-plated rack, each being numbered to correspond with a bed. Dirty linen is collected in bags, and delivered by a lift outside the building to a trolley which runs on a concrete way to the boiler house. Here the bags are dumped into a steam washer and then are placed in a drying machine, whence they emerge properly disinfected and in a fit state to be sent to the laundry. On each floor is a steriliser for the patients' crockery and knives and forks, and adequate refrigerators for milk and other foodstuffs are provided.

The Operating Theatre.

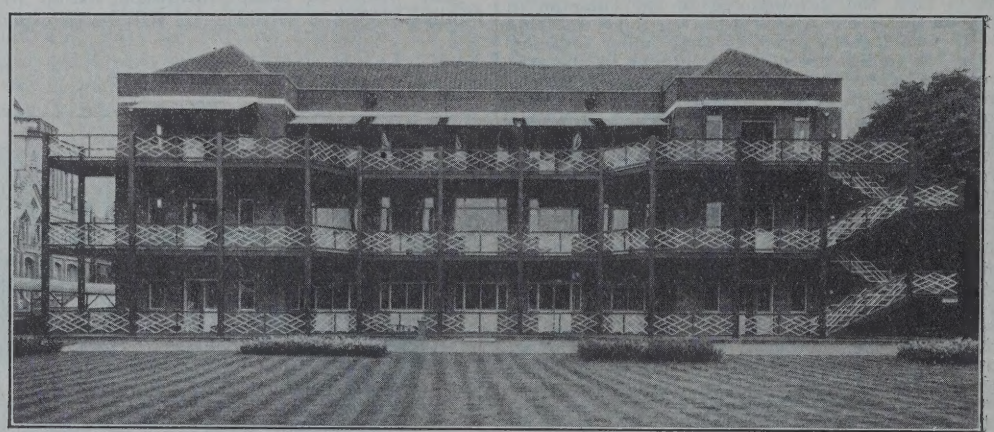
The operating theatre suite is grouped round the large octagonal lobby into which the corridor expands on the first floor of the building. The theatre is provided with modern lighting and equipment, and heated with steam coils let into the north wall; cold filtered air is sucked in from outside. The theatre communicates by means of doorless openings with rooms for dressings and lotions and also with the theatre sterilising room.

On the west of the theatre octagon is the anæsthetic room, on the east the recovery room, whence the patient is wheeled back again to her ward. A retiring room and lavatory and bathroom for the medical staff are near by, and there are also two wall cupboards, one for operating coats and the other for rubber boots. The sister in charge of the theatre has ample dresser and linen cupboard accommodation in her room, the linen being stored on wooden grids, each one of which can be lifted out for sterilising. The motor operating the bed lift has been enclosed in a soundproof chamber on the roof in order to avoid noise.

Kitchens and Boiler House.—No kitchens exist in the isolation block, all the cooking for the patients being carried out in the kitchen of the temporary nurses' home by means of food trolleys which can be kept heated by electricity. After the food containers have been removed to the ward kitchens, whence the food is served to the patients, they are sterilised before being put back in the trolleys for the return journey. Trolleys of a different type convey the food to the 22-bed auxiliary hospital now opened in an adjacent villa to relieve the congestion at Queen Charlotte's.

The isolation block is connected by an underground pipe channel with the boiler house, which is equipped on a sufficiently large scale to cope with the requirements of the future buildings. Automatic electrically driven oil burners supply the fuel for the boilers.

FIG. 2.



Southern aspect of isolation block.

A STUDENT'S AMBULANCE.—Last week the Guild of Undergraduates of Liverpool University presented to the Merseyside Hospitals Council the second ambulance that has been purchased out of the proceeds of their collections.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of three metropolitan boroughs, one county borough, one borough, and an urban district.

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Lambeth .. (294,400)	15·7	14 9	1·18	1·70	3·1	3·2	68/27	40	3·5
Kensington.. (176,000)	14·4	15·4	0·78	1·60	3·8	2·7	84/27	51	6·3
Bermondsey . (113,800)	19·8	14·5	1·21	1·27	4·6	1·7	71/—	45	2·2
Darlington .. (71,790)	16·8	13·1	1·10	1·16	2·7	2·1	81/36	38	6·6
Swindon .. (62,020)	14·0	11·0	0·43	1·47	2·0	2·0	47/21	30	6·9
Swinton and Pendlebury (34,100)	13·3	13·1	0·85	1·32	3·9	1·3	90/53	48	11·0

Number of stillbirths per 100 live births: Lambeth 3·7, Kensington (notified) 2·5, Bermondsey 2·9, Darlington 5·5, Swindon 5·1, Swinton and Pendlebury 4·6.

Lambeth.

Dr. A. G. G. Thompson reports a satisfactory increase in the attendances at the antenatal clinics. The individual expectant women who attended numbered 2021, whilst the total births for the year were 4622. He is not satisfied with the supervision of the ex-babies, as only 3675 out of at least 15,000 children aged 1 to 5 were brought to the centres. The 29 notifications of enteric fever included a disastrous outbreak, affecting one household, with 12 cases and 3 deaths. Two families of 20 persons inhabited a small four-roomed cottage with a small yard in which there was one w.c. and one water tap for the needs of both families. One of the mothers, a charwoman, developed an illness which simulated pneumonia, was nursed at home, and died after ten days. Two other members of the family were then stricken with typhoid fever, confirmed bacteriologically and removed to hospital. Subsequently nine other members of the two families sickened. In the original case symptoms of typhoid fever appeared near the end, but bacteriological examinations and a post-mortem revealed nothing beyond pneumonia. The only vacant accommodation on the L.C.C. estates was at Becontree and thus out of reach of the many workers who must live near their work. For these the 136 flats to be erected on two sites will afford some relief.

Kensington.

Dr. James Fenton reports that mortality from childbirth showed an increase in the borough. Although 72 per cent. of the expectant women in Kensington received some form of antenatal care, there were 16 deaths of mothers in confinement. Of the 16 women who died, 12 did not receive antenatal attention, and it appears probable that, if they had, five lives might have been saved. In 5 of the 12 antenatal advice would have been of no avail, the only preventive being avoidance of pregnancy. In the other two there was accidental infection at the time of birth, which could not have been prevented by antenatal care. The number of new cases receiving light treatment at the baby clinic and hospital was 150, and the cases of rickets, debility following measles and whooping-cough showed improvement.

Satisfactory work is reported under Section 3 of the Housing Act of 1925, which enables the local authority to carry out repairs in the owner's default and to recover the cost with more certainty than the corresponding section of the 1919 Act. The houses dealt with under this section have numbered 242 and it has only been necessary for the council to do the work in 18 cases, at a total expenditure of £2333. Of this amount, £1339 has been recovered and the remaining £994, with interest, is now being received in instalments. A very good standard of work is being obtained under this section; the owners are responding more readily to notices, and it is believed that this section will prove of considerable value in improving the working-class houses within the borough. Effective action is also being taken to deal with instances of overcrowding and indecent occupation. Thus, during the last five years only 29 summonses have been eventually issued in 371 cases of overcrowding and only two summonses in 318 cases of indecent occupation. This means that 658 families have been able to improve their accommodation without the council having to resort to extreme measures. Another new move has proved beneficial in the relief of overcrowding. When a municipal house is let to a tenant, the medical officer of health writes to the owner of the vacated house, asking him to let to a Kensington family known to be living under overcrowded conditions. A similar method is also being adopted when tenants are moved to L.C.C. and other housing estates. Great improvements have been made in the common lodging-houses for women as the result of private philanthropy.

Of the 22 notified cases of ophthalmia neonatorum one died from another cause and the remainder recovered without injury to sight. Since 1920 there has only been one case resulting in blindness. There were 13 notifications of puerperal fever with 7 deaths, and 41 of puerperal pyrexia with 3 deaths. Dr R. Hobbs, the consultant retained by the council, was called in by local practitioners in 30 cases and visited 4 patients in their homes, while 21 cases of puerperal sepsis were admitted to St. Mary Abbots Hospital under his care.

Bermondsey.

Dr. D. M. Connan's report states that the new patients treated at the solarium numbered 408. A small number of cases of pulmonary tuberculosis showed no improvement. Rickets and malnutrition did well if the attendance was regular, but many mothers do not realise that advanced rickets needs regular prolonged treatment. Nine antenatal mothers improved in health and had normal confinements with healthy babies. Better results than previously were obtained in alopecia. The final result in all the 20 cases sent by the borough council to Leysin has been good and there have been no relapses up to date. Out of 2086 births in the borough 1805 took place either in hospital or in connexion with Guy's Charity. A new scheme is in partial operation under which the fees of approved midwives attending confinements in the home will be paid by the borough council. This will apply to the cases attended by Guy's Hospital and the condition is made that all cases taken by the hospital shall be attended by a midwife. In the past a large number of the cases in the borough have been attended by handy women.

Darlington.

Dr. G. A. Dawson mentions amongst the needs of the town: the proper adaptation of the five centres for the examination of expectant mothers; housing accommodation at about 6s. per week for at least 200 families living in dark court or back-to-back dwellings, an up-to-date swimming bath with continuous

filtration and chlorination; and a modern central slaughter-house and meat store. Artificial light has been installed at the fever hospital and good results are claimed for convalescent debilitated scarlet fever patients. Great difficulty is experienced in finding suitable institutions for the mentally defective. The special school for these children does excellent work, but most of the children on discharge join the ranks of the unemployed. Last year an occupation centre was opened for them. In the poorest quarters of the town several families are living under terrible conditions of overcrowding. The weekly rent of 7*s*. 6*d*. charged for the new corporation "kitchen" houses is a barrier to many hoping to improve their environment. The worst class of house is the most crowded, because the occupants are deterred from moving by the steepness in the ladder of rents. The corporation have built no houses since 1926. Plans are given showing the arrangement of three types of back-to-back houses, housing about 3750 persons. In most of them there is a total lack of wash-house, scullery, and food store accommodation. But for the shortage of houses, many of the "back-to-backs" could be readily converted into "through" houses. Immediate requirements are about 500 new houses to be let at 7*s*. 6*d*. per week. A conversion scheme is in progress but there are still about 5000 privy middens out of 18,500 conveniences. The open-air school with accommodation for 60 boys and 60 girls and the Barnard open-air school for the education of mentally subnormal children have achieved excellent results in their first year's work. The George Dent Nursery School for 80 children from poor homes or suffering from malnutrition has also done well, and the education committee are considering the establishment of other nursery schools in the town.

Swindon.

Dr. Dunstan Brewer thinks the doubling of mental defect during the last 20 years must be accepted as a fact. In October, 1928, the municipal housing estate was brought into the borough. The rule has been adopted to let municipal houses to persons with large families, but Dr. Brewer points out that the payment of the rentals charged means that these families have to go without some of the prime necessities of life. In 1922 the municipality acquired a temporary maternity hospital, in December, 1928, they took over the training school and extern midwifery service from the Wilts Nursing Association, and in 1929 Dr. Sydney Rowlands was appointed consulting obstetrician to the hospital and for other obstetric purposes. The maternity service so established serves the district outside the borough and is worked in coöperation with the county council. During the year there was some trouble in the hospital with puerperal pyrexia. There were 20 cases but many would not have come into the notification category had four-hourly temperature charts not been insisted upon. The hospital was closed from the 11th to the 14th of May. The 40 notifications of puerperal pyrexia were all investigated and included five cases of scarlet fever without a death. They were cases of typical scarlet fever without special feature all in the practice of one midwife, who was eventually proved to be a carrier of Dick's streptococcus. The Registrar-General debits Swindon with six maternal deaths, but Dr. Brewer thinks it is right to include three more as associated with childbirth, making a maternal mortality of 10·4 instead of 6·9. During the last ten years there has been no gap between infancy and school age in Swindon, but it is intended to complete the supervision of the pre-school child by arranging a systematic mental and medical inspection about the beginning of the child's fourth year of life. Dr. Brewer stresses the need for rapid action in the case of illness of a child during the second year of life. As in past years all the stillbirths and the deaths under the age of 20 have been investigated. A complete history is kept at the health office of all children, and it is found by this means that the reliability of death certificates is less than 40 per cent. Dr. Brewer hopes that in time general practitioners will take to using this bureau of information and that by this means diagnosis will be made easier, life will be saved, and many exploratory operations rendered unnecessary. The method adopted in Swindon originated from the teaching of Clifford Allbutt and Charles MacKenzie.

Swinton and Pendlebury.

Dr. H. C. Mulholland says the increased death-rate and infant mortality were chiefly due to the influenza epidemic. Scarlet fever cases numbered 112, 59 less than in the previous year. There were no deaths, and Dr. Mulholland points out that if antitoxin is more used, more cases can safely be nursed at home. Antitoxin is now supplied to doctors, on request, by the public health department. Diphtheria shows a tendency to increase and it is hoped that parents will take more advantage of the immunisation facilities provided at the centres. The high maternal mortality is mentioned as a reason for increased antenatal work. The consultant's report shows that 133 mothers attended this clinic, as against 84 in the previous year. The mothers who attend are interested in getting whatever help they can and the dental treatment provided is becoming more appreciated. Beds at Davyhulme Hospital are available for pregnant women, and there is no difficulty in obtaining hospital treatment for all the puerperal sepsis which occurs in the district. 49 per cent. of the births occurred in two-bedroomed houses, 30 per cent. in houses containing two or more families, 8 per cent. in grossly overcrowded houses. The percentage of total births occurring in miners' families was 17·3, whilst the percentage of infant deaths in the same families was 47·6. The percentage of total births which occurred in labourer's families was 15·6 and the percentage of infant deaths was 23·8. This means that the miners' families had two and a half times and the labourers' families one and a half times their proper proportion of the infant deaths. The sanitary environment of the district has been much improved by the disappearance of the privy middens. Referring to the connexion between damp houses and rheumatism Dr. Mulholland mentions that many of the houses have no damp-proof course and that at least 300 are only fit for demolition.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 5TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 156 (last week 182); scarlet fever, 1754; diphtheria, 1160; enteric fever, 67; pneumonia, 546; puerperal fever, 48; puerperal pyrexia, 95; cerebro-spinal fever, 14; acute poliomyelitis, 8; encephalitis lethargica, 17; continued fever, 1; dysentery, 9; ophthalmia neonatorum, 95. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 8th–9th was as follows:—Small-pox, 281 under treatment, 11 under observation (last week 354 and 6 respectively); scarlet fever, 1808; diphtheria, 1996; enteric fever, 26; measles, 385; whooping-cough, 80; puerperal fever, 29 (plus 15 babies); encephalitis lethargica, 122; "other diseases," 11. At St. Margaret's Hospital there were 15 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 27 (9) from measles, 6 (2) from scarlet fever, 9 (0) from whooping-cough, 28 (8) from diphtheria, 56 (11) from diarrhœa and enteritis under two years, and 16 (2) from influenza. The figures in parentheses are those for London itself.

Four deaths from measles occurred at Liverpool, 3 from whooping-cough at Birmingham. Five fatal cases of diarrhœa were reported from Liverpool, 3 each from Birmingham, Nottingham, and Manchester.

The number of stillbirths notified during the week was 265 (corresponding to a rate of 37 per 1000 births), including 42 in London.

CORRESPONDENCE

EFFECT OF RADIUM ON CARCINOMA.

To the Editor of THE LANCET.

SIR,—Mr. W. H. C. Romanis has drawn attention in your last issue to an unusual event following the treatment of a carcinoma of the breast with radium—namely, the appearance of nodules of growth in the skin at the sites of implantation of the radium needles. He suggests that this was due to stimulation of the growth of carcinoma cells by the radium. I think, however, that another explanation is more probable. Mr. Romanis reports that "it was determined to use radium needles of 1·0 mg. each by the usual technique of implantation for 14 days. Thirty needles were implanted," in the breast and lymphatic areas. May I point out, however, that this technique is entirely different from that elaborated at St. Bartholomew's Hospital; this has been published in detail, and is, as far as I know, the only technique which has been extensively used in treating primary carcinoma of the breast. The difference in the technique used by Mr. Romanis lies in the radium content of each needle, the length (presumably, though no detail is given), the total dose, and the time of irradiation.

It has been our practice at St. Bartholomew's to use chiefly needles of 3·0 mg. Ra element each, 4·8 cm. active length, and 0·5 or 0·6 mm. platinum filtration. An advanced carcinoma of the breast requires from 40 to 70 mg. Ra element for the *breast alone*, apart from the lymphatic areas, and the standard time of irradiation has been seven days.

I have always insisted on the importance of using *long* needles in treating carcinoma of the breast owing to the necessity for irradiating evenly the whole area involved, and where possible I have avoided pushing them into the growth itself, the main part of the radium being applied *deep* to it. I have adopted this principle owing to the obvious danger of transplanting carcinoma cells on the ends of the needles, which are necessarily inactive.

It therefore appears to me possible that Mr. Romanis, by using needles which were too short and a total concentration of radium which was too small, may have provided tracks along which carcinoma cells were enabled to grow, many of these cells having been insufficiently irradiated. It is true that the needles remained in position for 14 days instead of the usual seven, but I am not persuaded that implanting 30 mg. for 14 days necessarily has the same therapeutic effect as implanting 60 mg. for seven days. I have always regarded a "milligramme-hour" standard as misleading and dangerous.

If Mr. Romanis would adopt the technique which has been found satisfactory in a large number of cases elsewhere, he may be able to avoid in future the unusual event which he here records.

I am, Sir, yours faithfully,

London, July 11th, 1930. GEOFFREY KEYNES.

To the Editor of THE LANCET.

SIR,—Mr. Romanis's case is more easily explicable, surely, as an illustration of the effects of the setting free of cancer cells in the needle-track, beyond the range of action of the low intensity (1·0 mg.) needles, than as a clear instance of the much disputed stimulation. A definite, but still not very clear, stimulation appears in the connective tissue of some radiated growths—e.g., rodent ulcer and some sarcomata, but there is only very dubious evidence of any real stimulation of malignant cells, in spite of the thousands of cases where it should have been recorded as a result of X ray or radium applications by observers in many countries, and there are findings like those of Nather and Schinz with varied X ray doses on cancer implants in a series of 200 mice, which were completely negative. Without any evidence whatever a "cancer stimulation-dose" was put forward by Seitz and Wintz in their book in 1920, but all the later discussions of the subject by radiologists have tended more and more to relegate the subject to the background, or to take refuge in some "functional-stimulation"—i.e., one not capable of histological proof, in such organs as the thyroid, spleen, and ovary.

I am, Sir, yours faithfully,

J. H. DOUGLAS WEBSTER.

Chandos-street, W., July 12th, 1930.

To the Editor of THE LANCET.

SIR,—The note by Mr. Romanis on this subject in your last issue properly revises the old doubt which has for long given all who use radium furiously to think; but the reported case, to my mind, does not quite carry conviction.

If it be a case of stimulation of existing cancer cells, then it occurred at the point of maximum intensity, immediately about the needle; just where, presuming ordinary screenage, the effect approaches or reaches a destructive or necrotic degree. It seems more likely that the damage done to the tissues at this point has still further weakened the feeble defence presented by normal tissues to the infiltration by the active cancer cell. It is not very uncommon to see nodules form in suture needle cicatrices when cases already fungating are operated upon, and it is certainly rare to find nodules in the much more definite cicatrices of the large platinum needles. Need we blame the irradiation at all? Or is it perhaps the "irritation" of a minute local "burn" that determines the appearance of cancer? This case itself is evidence against the "production" or "causation" of cancer, for the needles implanted in healthy tissues (near the glands) were, it is implied, not affected. It would be a new piece of evidence if a single irradiation "determined" cancer. Here a single irradiation of 14 days was followed by the appearance of nodules "within six months." It can scarcely be that an intensity *less* than that required to secure death, or retrogression, or metaplasia of cancer cells is adequate to "stimulate"; for in that case at *some* distance from every implanted radium unit the lesser ("stimulant") intensity must be reached, and all cases should show new nodules of growth at some point in the body. Is this so? It needs consideration. It is useless, of course, in these problems to appeal to the pure physics of radio-activity. The phenomena of acquired radio-resistance are alone enough to settle that. But what are the unknown factors in this problem? Mr. Romanis's case is suggestive indeed, but, without any intention of quibbling, I would ask, is it really suggestive of "stimulation?"

I am, Sir, yours faithfully,

E. ROCK CARLING.

Brook-street, W., July 15th, 1930.

THE WIDAL TEST.

To the Editor of THE LANCET.

SIR,—Dr. Eustace Thorp's experience with the Widal test, published in your issue for June 7th (p. 1235), corresponds so closely to what used to be my own experience, that I cannot help commenting on it. It is just this "negative Widal" in what afterwards turned out to be sure cases of enteric, which has brought the "Widal" into disrepute with the majority of clinicians in South Africa, and the lack of respect for "laboratory findings" in general which is so noticeable out here is in large measure due to the apparent failure of laboratories to reach satisfactory results with this supposedly simplest of serological tests. Of course, the clinician who only labels such of his cases "typhoid fever" as on one or other occasion have given a positive "Widal," and ignores other cases, will, when he goes through his records of typhoid patients at a later date, observe a very satisfactory incidence of positive tests, and this all too common error in logic still obscures the shortcomings of the ordinary "Widal" in many quarters. Dr. Thorp did just the opposite, he followed up the cases where the "Widal" was negative and found them to have typhoid fever. Unfortunately, he does not give particulars about the nature of the "Widal" employed.

When, in 1922, by similar methods I arrived at the identical conclusion that the "Widal" is not much use for the diagnosis of typhoid fever, I replaced this test by a complement-fixation method. This proved highly satisfactory, since it brought the percentage of positive reactions in first tests on sure cases of typhoid from about 50 with the Widal to 96 with the complement-fixation method. These findings were ignored, or held to be applicable to South Africa only. It was only when A. Felix, in a series of papers, demonstrated (1) the importance of O-agglutination; (2) the fact that and the reasons why O-agglutinins cannot adequately reveal themselves through an ordinary "Widal"; (3) the practical identity of O-agglutinins and complement-fixators; and (4) the peculiar sensitiveness of a particular strain of typhoid bacilli for O-agglutinins, that the good results achieved with complement-fixation could be brought into line with all other findings and the whole position cleared up. In the past few months THE LANCET has given a good deal of publicity to this new orientation in serological tests for typhoid fever.

It has now become possible to replace the complement-fixation test, with its drawback of difficult execution, by an agglutination test again, but this time with due regard for the formerly neglected O-agglutination. If we must go on calling this a "Widal," let us then speak of a "Felix-Widal." My results with this method were published in the February issue of the *Journal of Hygiene* (p. 380). Further experience during another typhoid season completely bears out the conclusions I there recorded: that it is possible to diagnose serologically practically every case of typhoid fever at the first blood examination, provided due attention is paid to O-agglutination. For the technique I must refer to original articles, more especially that by Dr. Felix in THE LANCET of March 8th, 1930, p. 505. I admit the difficulty of using live suspensions of bacilli for the tests, but here the Oxford standard laboratories have come to the rescue by placing special O-sensitive killed suspensions on the market.

There is, therefore, nowadays no excuse for a "negative Widal" in a case of typhoid fever. But as long as laboratories will go on using any old carbolised suspension of typhoid bacilli for agglutination tests and call that a serological diagnostic method, so long there will be dissatisfaction among clinicians, many diagnoses will be missed, many carriers will remain undetected, and the incidence of typhoid fever will not decrease.

I am, Sir, yours faithfully,

ADRIANUS PIJPER.

Pretoria, South Africa, June 25th, 1930.

THE INTERPRETATION OF DENTAL RADIOGRAMS.

To the Editor of THE LANCET.

SIR,—Medical men have for many years known and proved to the satisfaction of all concerned that localised systemic infections and intoxications could be due to dental sepsis. Until recent years these opinions were strongly opposed by the dental profession, and it is only after years of persistent repeated demonstrations that the dentists have been brought to realise the importance of dental sepsis. Even to-day many dental surgeons of repute will not admit that dental sepsis has any influence on the health of the individual, and as a consequence ignore obvious naked-eye or radiographic evidence. Radiologists have provided the medical profession with definite and visible signs of obscure dental sepsis, the appearance of which can readily be learnt by any interested person. Yet the leading article of THE LANCET of July 12th, and the series of articles by Mr. Bowdler Henry dealing with this subject, suggests that the only person capable of giving an opinion on a radiograph is a dentist, and that the opinion of a physician, whether a radiologist or not, is of little value, as shown by the following statement: "Among dental surgeons it is a commonplace of conversation, not often expressed in print, that radiographic reports in general have little value." Further, Mr. Henry, although he has gone to some pains to illustrate many of the radiographic appearances of pathology of the teeth—which has been done quite as ably on many former occasions by radiologists—for some reason or other thinks that the medical man has not, or is not capable of acquiring, the knowledge of these appearances and of giving an opinion on the radiographic evidence of dental sepsis. I quite admit that the possession of an X ray equipment and the production of radiograms does not signify that the possessor has taken the trouble to learn the anatomy and pathology of the part or its radiographic appearances, but it must be obvious to most that the specialising radiologist is much more likely to possess the ability to produce a good radiogram and the knowledge to interpret its appearances than the busy dental practitioner who is provided by the manufacturers with a "fool-proof" apparatus.

The editorial article states: "Here lies the importance of studying the minute and intimate bone structure, which is only possible in a set of radiograms of high technical quality," but even Mr. Henry has had to call in the help of Messrs. Kodak, Ltd., in producing his illustrations. Mr. Henry points out that "A radiogram requires careful study under proper conditions of illumination and magnification by one who has knowledge of the structure of the teeth and jaws." Yet every radiologist is called upon from time to time to radiograph the teeth of patients which have been radiographed a short time

before by a dentist, and nothing reported as to the presence of sepsis, either to the patient or to his doctor, and finds definite evidence of old-standing septic lesions which have been missed or ignored by the dentist. One wonders why, if these obvious lesions are so ignored, the dentists takes radiographs at all, and one is forced to think they have taken the advice of a well-known text-book on dental pathology and therapeutics, which advises dentists to take their own radiographs because "such profits as may accrue are his."

In Mr. Henry's article in your issue of July 12th (p. 95) the following astounding case is published with illustrations :—

"A patient of 60 years with a tooth showing a chronic abscess enjoyed good health for many years, annual radiograms showing the area to be of constant size and demarcation. A final radiogram showed the septic area to have broken bounds, the outline of the cavity becoming blurred and extending on one side. This was followed shortly by cardiac disturbance of toxic origin, which has not recurred since the tooth was removed."

The legend to the illustration reads as follows :—

Fig. XVI. (A, B, and C).—Showing chronic abscess G, clearly defined in 1926. In 1927 it was rather larger but still well defined within a smooth white wall. In 1928 the abscess has spread to the neighbouring tooth and has a hazy irregular wall."

And on page 96 Mr. Henry states a well-known fact :—

"The longer septic teeth remain in the jaw the less chance the patient has of complete recovery from infection after their removal."

That an abscess of this size should have been detected in the patient in 1926, allowed to remain, and annual radiographs taken so as to watch the progress until it involved other teeth, and the patient developed cardiac disturbance of toxic origin, is almost incredible. Yet this kind of "animal experiment" is frequently being detected by radiologists—no wonder Mr. Henry is opposed to the doctor sending his patients for radiographic examination first.

I have recorded the death of a friend, aged 36, in whom I found two septic teeth and advised extraction, but the advice was ignored by the dentist, and several months later, owing to an acute flare, the teeth were extracted and death resulted from septicæmia within a week. Mr. Henry refers to the fallacies of the radiograph, and suggests that the doctor or radiologist mistakes anatomical foramina for apical abscesses, which may result in a healthy tooth being extracted. I have repeatedly shown that the more important fallacy is made by the dentist mistaking a large apical abscess for a normal antrum or foramen, and a source of chronic sepsis remaining undiscovered until a physician has insisted upon an independent opinion from a radiologist. There are dental surgeons, no less enlightened than those referred to by Mr. Henry, who still send their patients to radiologists for an X ray examination and report. There is never any difficulty in such coöperation, and the radiologist is always prepared to take additional radiographs to clear up any doubtful point. These dental surgeons have the support of the patient's doctor and the radiologist in carrying out any extraction which may be deemed advisable, and he never appears in the unfavourable position seen so often, when the procedure is adopted, which the leader and article referred to advocates.

For these reasons I believe that the patient, dental surgeon, and the doctor are best served when an independent unbiased opinion is obtained from a competent radiologist on the radiographic appearance of the teeth.

I am, Sir, yours faithfully,

JAMES F. BRAILSFORD, M.D.

Birmingham, July 14th, 1930.

*** Mr. Henry acknowledges the help of the Kodak Company in the reproduction, *not* in the production, of his radiograms.—ED. L.

STERILISATION OF THE UNFIT.

To the Editor of THE LANCET.

SIR,—We have read with interest the valuable article on the above topic by Dr. F. A. Gill in your issue of June 21st. We would point out, however, that sterilisation for other than therapeutic reasons can be construed as illegal in this country at present. In fact, the law upon the subject is so ambiguous that it would be difficult for the Board of Control to give its sanction to a sterilising operation performed with any other aim than that of benefiting the health of the subject operated on.

With the object of getting eugenic sterilisation legalised a committee has been formed from the Eugenics Society, the aims of which have been set out in a pamphlet.[1] The views of this committee coincide closely with those of Dr. Gill in all except one respect. Dr. Gill says: "If every certifiable mental defective had been sterilised 20 or 30 years ago it would have made little appreciable difference to the number of mental defectives existing to-day."

We believe Dr. Gill to be in error in this supposition. One of us has shown[2] that if all the defectives in the community could be prevented from having children the effect would be, even on the most unfavourable genetic and social assumptions with regard to defectiveness, to reduce the incidence of mental defect by as much as 17 per cent. in one generation.

We are, Sir, yours faithfully,

C. P. BLACKER, R. LANGDON-DOWN,
R. A. FISHER, F.R.S., J. A. RYLE,
R. A. GIBBONS, C. COLLYER.

20, Grosvenor-gardens, London, S.W.1, July 12th, 1930.

GERSON DIET FOR TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—Perhaps you will allow me to add a few words to your interesting editorial note on the above in your issue of June 28th. A few months ago I had an opportunity of studying the Gerson diet, and of observing the results of the treatment in a wide range of medical disorders in Gerson's Clinic at Cassel, also in the Surgical Clinic of Prof. Sauerbruch, of Berlin University, and in other German institutions in which a special kitchen had been recently installed for this dietetic system. The results observed confirm the very favourable impressions of the great value of this treatment recorded by these authors, and confirmed by numerous independent clinicians in Germany in the past two years.

The very favourable results of the diet therapy recorded by Prof. Sauerbruch in the past few years apply specially to the treatment of surgical tuberculosis as it affects the skin, bones, joints, and lungs. The dietary system employed by Sauerbruch, while based on the Gerson principle, is somewhat

[1] Obtainable from The Secretary, Eugenics Society, 20, Grosvenor-gardens, London, S.W. 1.

[2] Fisher, R. A.: The Elimination of Mental Defect, Eugenics Review, 1927, xvi., 11.

different from the strict Gerson régime; it is based on modifications devised by Prof. Herrmannsdorfer of the surgical department of the Charité. Gerson, however, claims that his method has equal application, in a wide range of common medical disorders, such as arthritis, cardiovascular degeneration, disorders of the nervous system, and other conditions.

In view of the profound importance of the subject, it is interesting to know that arrangements have been made for the translation of Gerson's book.

I am, Sir, yours faithfully,

CHALMERS WATSON, M.D.

Edinburgh, July 10th, 1930.

NOISE IN HARLEY STREET.

To the Editor of THE LANCET.

SIR,—I have no doubt that every specialist in Harley-street would unhesitatingly agree that the use of the mechanical drill for road repairs, immediately opposite a hospital, is bad for both patients and staff, but I believe I am correct in stating that in their protests against the use of this fiendish device within a certain radius the hospitals have so far "ploughed a lonely furrow." The correspondence in your columns illustrates how necessary personal experience of a nuisance sometimes is to ensure a proper appreciation of it, and I hope that "Harley-street" will now make its voice heard and its influence felt with the object of ensuring that the use of the drill will be forbidden within, say, one hundred yards of any hospital. I am, Sir, yours faithfully,

RALPH B. CANNINGS,
Secretary, City of London Maternity Hospital.

July 11th, 1930.

TREATMENT OF VENEREAL DISEASE IN THE EAST END OF LONDON.

To the Editor of THE LANCET.

SIR,—Your editorial note on the treatment of V.D. in this hospital needs a small correction for the sake of accuracy. You write that the annual grant contributed by the L.C.C. towards the work of the clinic carried out under the auspices of the hospital was "withdrawn."

This is unintentionally misleading. The L.C.C. were quite willing to go on with the agreement and to continue the grant, but the hospital came to the conclusion that it would be a better arrangement to lease the premises at an agreed rent, and to leave the management entirely to the L.C.C. under their own chosen head, rather than to continue a sort of joint management.

I am, Sir, yours faithfully,

KNUTSFORD.

London Hospital, Whitechapel, E., July 9th, 1930.

A PROTEST FROM REGISTERED NURSES.

To the Editor of THE LANCET.

SIR,—The Royal British Nurses' Association and the British College of Nurses take strong exception to the following advertisement which appeared in the *Nursing Mirror* of June 14th last:—

"Will those nurses who have failed in their final State or hospital examinations, either this or last year, and who have left or are leaving their training school, communicate their name and address to 2725, "The Nursing Mirror," 24, Russell-square, London, W.C. 1, when they will be offered posts with a salary equal to that of a trained certificated nurse."

This advertisement is calculated to cause injur to the members of the nursing profession because i ignores the legal status of that profession, disregard the value of a minimum standard of qualification a established by the State, undermines the economi privileges of the nurses, and fails to protect the sic from unqualified and dangerous attendants. Th Royal British Nurses' Association and the Britis College of Nurses beg to enter the strongest protes against such an advertisement.

We are instructed to forward to you this protes for publication.

We are, Sir, yours faithfully,

ISABEL MACDONALD,
Secretary, Royal British Nurses' Association.

ALICE STEWART BRYSON,
Secretary, British College of Nurses.

194, Queen's Gate, London, S.W., July 12th, 1930.

TREATMENT OF DELIRIUM TREMENS.

To the Editor of THE LANCET.

SIR,—I am interested in this subject, and shoul like to see a full account of the remarks by D E. F. Wills. However, your annotation in TH LANCET of July 12th states that the main questio with which he dealt was whether the sudden witl drawal of alcohol is a factor in the onset of deliriu I gather that Dr. Wills holds: (1) that delirium more likely to manifest itself when alcohol has bee abruptly discontinued; (2) that in cases associate with shock, the real factor determining the sympto (delirium) will be found to be the withholding alcohol.

The assigned causes of delirium tremens are variou Yet I suppose that we all agree that the commone cause is the taking of alcohol to excess. My experien with inebriates may be interesting in this connexio and I briefly set it before your readers for what is worth. I have been medical superintendent inebriate reformatories, 1903–12. During that perio I had under my care upwards of a thousa inebriates, and a large percentage of these were se to me direct from the courts, and, therefore, fre from a "bout" or a "soaking." In every case alcoh was absolutely barred from the date of admissio In not one single instance did delirium treme develop.

I therefore hold that the sound treatment for t inebriate is to stop the alcohol, and soothe or stimula according to the condition of the individual.

I am, Sir, yours faithfully,

DAVID MCVEA FLECK.

Stapleton, Bristol, July 14th, 1930.

*** We understand that Dr. Wills's paper will appe in the October issue of the *Journal of Inebriety.* ED. L.

BRISTOL GENERAL HOSPITAL.—Last year t excess of ordinary expenditure over ordinary inco was £10,544, and it has again been necessary to u nearly all the free legacies received during the year make good the deficit. The president, Sir Vernon Wi and his four sisters have contributed £20,000 to found "George Alfred Wills Endowment Fund" towards t maintenance of the Susan Britton Wills Nurses' Fund. new children's ward, a new male ward, and a new operati theatre are being provided at a cost of over £17,000. Th were 4671 in-patients, who cost £8 10*s.* 10*d.*, and stayed average of 19·31 days. The new out-patients numbe just under 31,000.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

ON July 10th, in the House of Lords, the Royal Assent was given to 38 Acts, including the Mental Treatment Act.

WORKMEN'S COMPENSATION (SILICOSIS) BILL

On the question that Clause 1 (which extends the Workmen's Compensation Act, 1925, to industries involving exposure to asbestos dust) stand part of the Bill, Mr. SHORT, replying to questions by Mr. C. Williams and Major Braithwaite, said the extension of the Act of 1925 to asbestosis was due to the report of an inquiry submitted to Parliament in March, 1930, that there was grave danger of workers in the asbestos industry contracting fibrosis of the lungs, culminating not merely in disablement but in death. Fourteen deaths were recorded, and the incidence of the disease affected one in eight of those employed, a figure that only applied to those who were actually in employment at the time when the examination took place. Roughly 2000 people were thus employed. The employers, who believed that the provisions of this Bill were on the right lines, and the Trade Union Congress, representing the industries and workers concerned, were also agreed.

The clause was added to the Bill.

MEDICAL ARRANGEMENTS.

On Clause 2 (which deals mainly with the coördination of the medical arrangements in connexion with compensation schemes),

Dr. VERNON DAVIES, having moved and later withdrawn an amendment confining the operation of the clause to groups of industries and processes in which silica or asbestos is used industrially, moved after the word "coördinating" ("coördinating the medical arrangements") to insert the words "or altering." He said that this amendment hung very considerably on another which he had on the Order Paper providing that the medical staff concerned with the diagnosis of silicosis, and particularly of asbestosis, should be full-time medical officers in the employment of the Home Office. His reason for suggesting that was that the diagnosis of silicosis and asbestosis required men of great experience and expert knowledge. There were not many of those men in the country at present, and when they considered that in the future these cases coming up for compensation would be open to very grave doubt as to whether the state of health was really due to the condition of the lung, it was essential that the medical men who examined and reported on this scheme should be absolutely expert. The diagnosis of silicosis was easier than that of asbestosis, inasmuch as it can be done by X ray photography and did not require the difficult laboratory procedure.

Dr. Davies proposed that the Home Office should have a staff expert in the diagnosis of these diseases; whole-time Government servants, or at any rate medical officers "who could not be got at."

Mr. SHORT said that there were few doctors in the country who could diagnose these diseases, and when the hon. Member wished to do away with the employment of part-time medical officers there were two points to be dealt with. There was the periodical medical examination of workers employed in the industry which would be carried out by the medical board—whole-time officers. Supposing the periodical examination took place at the factory they could not expect the members of the Board to go back whenever an employer was taking on a new employee. What had been done—and it had proved effective—was to utilise the services of the local tuberculosis doctors for the initial examination.

Dr. DAVIES said that those officers were State officers.

Mr. SHORT said that was so, but they were not answerable to the Home Office in the same sense as the medical boards and members of the medical panel. If he accepted in its entirety the hon. Member's amendment the Home Office would not be able to use a part-time medical man. That would be fatal. But he did not think there was much between them in this matter. They recognised that if they were ever going to deal with this dread disease they must have experts who would have at their disposal all the latest machinery and knowledge of medical science. Therefore the Department did propose to ensure the appointment of full-time medical men, and they possessed sufficient statutory powers for the purpose. At the same time they would not like to lose the services of part-time medical officers.

Colonel FREMANTLE differed a little from Dr. Davies, but was, generally speaking, in favour of the general practitioner as the basis of all work because he had a general sense of proportion. It was useful to have medical boards and consultants from pathological laboratories and hospital staffs, but it was all the more important to have men in general practice who knew how the expert view fitted into the whole. That was one of the dangers of the divorce between the different Government departments in regard to their medical branches. There was need for some controlling committee for medical affairs which would bring the medical department of the Home Office into contact with the Ministry of Health and of half a dozen other departments of the State which had big health departments. He would prefer to leave this matter in a rather fluid state, hoping that the Home Office would become less and less departmentalised in regard to medicine, and would use more and more the services of men working under other departments and in other capacities. He hoped that that would mean that the Home Office, with its very excellent medical department, would devise the scheme in an elastic way in order not merely to meet the necessities of this Bill but to fit in with the constantly increasing number of measures which must be passed in connexion with industrial health.

After further discussion Mr. SHORT said that the choice of medical officers for the work would be open to the whole profession, who would apply to the selection board at the Home Office. He thought periodical examinations might take place yearly or at intervals of two or three years on the assumption that there would be two or three additional panels; that would mean that it would cost £5000 or £6000, making the total cost, roughly speaking, from £14,000 to £15,000, towards which a Treasury grant would help.

Dr. DAVIES admitted that there was very little between the Under Secretary for the Home Office and himself, and withdrew the amendment when the committee adjourned.

FEES AND OFFICIAL SALARIES.

The Bill was further considered by Standing Committee A on July 10th. Mr. CECIL WILSON was in the chair.

Mr. C. WILLIAMS asked how much of the official salaries and expenses would come out of the fund.

Mr. SHORT said the resources of the fund would be derived from fees paid by employers for periodical examinations, and there would also be a certain sum to be derived from fees for the examination of workpeople. When a workman sought a certificate it was intended to be provided within the scheme that he should make some contribution for the certificate. In addition there would be a contribution from the Treasury. The Treasury contribution would augment the fund, out of which would be paid all the medical expenses and so forth. The contribution of the Treasury would not be an independent fund, but

would be linked up with the fund derived from the fees. It was estimated that the contribution from the Treasury would be somewhere in the neighbourhood of £1000. The chief medical officer would receive £1100, and other members of the Board would receive salaries varying from £750 to £900, with a small allowance of £50 to each of the senior members of the three panels. When they linked up, as they hoped to do, the existing arrangements under the refractories and sandstone scheme with this newer scheme, and made it more national, these matters would be subject to variation. Whether the dependents would have to pay for a post-mortem examination had not yet been decided. The Home Office had undertaken to appoint an advisory committee, and to consult all the interests concerned with a view to securing the largest measure of agreement between employers and representatives of the workers. Subsequently the Home Secretary would draw up rules and regulations setting out the nature of the fees in respect to all these matters. These rules and regulations would be submitted to Parliament, which, if it chose, could annul them.

Mr. HOLLINS moved an amendment providing that no fees should be charged to a workman for any examination except in the case of a workman who made an application to the medical board for an examination, when the board, if they considered the application a frivolous one, might require the applicant to deposit the prescribed fee, not exceeding five shillings, the deposit to be refunded to the applicant if his claim was upheld by the board. He said he was rather startled by the statements of the Under Secretary. Some portion of the cost of the medical board would be placed on the workpeople. His amendment sought to limit that burden. Claims for compensation in the case of industrial diseases ought to be placed upon an entirely different basis from accidents.

A long debate ensued on this amendment, which was withdrawn, and Clause 2 was ordered to stand part of the Bill.

On Clause 3 (Short Title and Construction) an amendment moved by Mr. HACKING to include the word "asbestosis" in the title of the Bill was accepted by Mr. SHORT and agreed to.

The committee stage was concluded, and the Bill, as amended, was ordered to be reported to the House.

SLUM CLEARANCE BILL.

The House of Commons considered the Housing (No. 2) Bill on Report on July 8th.

Mr. JOWETT moved a new clause providing that the dimensions of houses built for rehousing purposes under this Act should not be less than the minimum requirements laid down by Section 2 of the Housing Act, 1923. He said as far as he could gather there was nothing in this Bill requiring a minimum size for the houses to be built under it. That was a most unfortunate omission in a Bill which based the State subsidy on the number of persons to be accommodated and not on the house itself. In the Act of 1923 a self-contained house of two storeys must not have a superficial area of less than 620 superficial feet, and a self-contained tenement must not contain less than 550 superficial feet. As far as he could estimate, a single-storey house with 620 superficial feet would allow of there being only three rooms of 14 feet square, with the necessary pantry, and accommodation for other purposes. If an extra bedroom had to be included, as would be necessary with a family of five, there must be a skimping of the size of the rooms beyond what was desirable or sanitary. That would be still more the case with tenement dwellings.

Mr. KINLEY in seconding the clause said that now they were making a beginning in dealing with the worst class of property they must not set up a low standard.

Mr. GREENWOOD, while sympathising with the amendment, said that, in the case of slums, minimum and maximum requirements must be disregarded, while in the case of very poor people every additional room not required was an unnecessary addition to rent.

When no additional bedrooms for children were required, he said, they made provision for smaller houses with lower rents, more conveniences, and less household work. Local authorities already had their by-laws dealing with the point of space per room, and it would be descending to very considerable detail to specify in an Act of Parliament the space per room, because that should depend upon the use to which a room was to be put and the number of persons who would occupy it.

Mr. ERNEST BROWN said he was sure that housing reformers throughout the country would read with dismay the defence made by Mr. Greenwood for turning down this clause.

Mr. HARRIS said, in this clause they ought to have it made clear that some standard of housing would be required. It was not a mere matter for the local authority, because the State and the local authorities were partners in this matter. There was a constant temptation to local authorities to build cheaper houses, but he was convinced that the local authorities ought not to attempt to build poor stuff to meet the needs of the poor. That would perpetuate slums. It would be a very bad thing for the country if the purpose of this Bill was to provide a lower standard than that provided in the Act of 1923.

Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that they were demolishing the slum houses and rehousing every single person, and that it might surprise Members to learn that in slum areas there frequently were very few children but many lone persons. The new clause did not alter the size of the rooms, but only the size of the houses.

Sir THOMAS WALKER said that the House would not be satisfied unless it had an assurance from the Minister of Health that provision would be inserted in the Bill to preserve a reasonable standard of size for the family house and a reasonable minimum of air space in the rooms.

Mr. GREENWOOD said that if the House would be satisfied that in so far as they built houses of the type built under the 1923 and 1924 Acts with elasticity at both ends, that standard should be maintained, he was prepared to insert an amendment in the House of Lords. That amendment would provide that in all these clearance schemes the two- and three-bedroom houses would conform to the standard of the 1923 and 1924 Acts.

Mr. JOWETT said in view of the promise given by Mr. Greenwood he would withdraw his clause.

The clause was by leave withdrawn.

On Clause 17 (Power of local authority to require repair of insanitary houses),

Mr. GREENWOOD moved an amendment providing that action by a local authority under the clause as regarded repairs to houses, and under Clause 19 as regarded demolitions, might be taken upon consideration of an official representation or a report from any of their officers, or other information in their possession.

The amendment was agreed to.

On Clause 27 (which lays down special conditions with which the local authority is to comply),

Dr. DAVIES moved the addition of the following paragraphs:—

(*c*) That the rents applicable to the houses shall be the same as those charged for similar houses provided by the local authority, or if there are no similar houses then as may be in proportion to those charged for other houses in the neighbourhood, having regard to size, materials, and amenities, but such rents shall be subject to rebates in the case of individual tenants as hereinafter provided;

(*d*) That rebates from the rents of the houses may be granted to individual tenants in such manner and on such terms and conditions as the local authority may think fit, provided that the total amount of such rebates does not exceed in any one year the total amount of the rent pooled formed as hereinafter enacted;

(*e*) That there shall be paid by the local authority in each year into a rent pool a sum equal to the difference between the rents applicable to the houses in accordance with this subsection.

Lieut.-Colonel FREMANTLE seconded.

Miss LAWRENCE said she must ask the House to reject the amendment. Under this Bill they were giving local authorities an additional subsidy, all of which must be passed on as reduced rents to the tenants. The variety of circumstances that the local authorities would have to take into account were so great that they must be allowed to carry out experiments in the matter, each suiting the case to its own needs.

Mr. CHAMBERLAIN regretted that Miss Lawrence had taken up so rigid an attitude. There was nothing in the Bill to prevent a local authority making a flat rate reduction on the rents of these houses, which would defeat the purposes of the Bill.

The amendment was negatived by 220 votes to 120.

On Clause 49 (which deals with official representations),

Dr. DAVIES moved an amendment providing that in urban districts with more than 10,000 population [against the 20,000 in the Bill] the county medical officer should not make representations to the local authority without consulting the district medical officer.

Miss LAWRENCE accepted the amendment, which was agreed to.

The Report stage of the Bill was concluded.

THE THIRD READING.

On the motion for the third reading of the Bill,

Sir KINGSLEY WOOD said that the vital question was whether the increased subsidy which the Bill offered would in fact provide houses at lower rents for the poorer paid members of the community. As a matter of fact, the rents of the Wheatley houses, notwithstanding the larger subsidy, were no less than the Chamberlain houses with the smaller subsidy. Therefore the Government were doing nothing for the poorer paid workers of the country. In the provisions for differential rents the Government were placing a most unfair burden on the local authorities.

Mr. GREENWOOD said he was glad that although the Bill had been improved in minor particulars its principle still remained. The Bill was not an alternative to the Wheatley Act; it was complementary to it, and was intended to deal specifically with a problem which hitherto had been ignored. That problem could not be dealt with merely by putting up more houses; it could only be dealt with by the double policy of destruction and reform of slum areas on one hand and the building of new houses on the other. He did not pretend that slums which had been in the making for 400 years would be destroyed in a few months, but the Bill was the first comprehensive measure designed to deal with this particular problem in a new and more effective way. He appealed to the local authorities to make the maximum use of the measure.

The Bill was read a third time.

ROAD TRAFFIC BILL.

HOSPITALS AND MOTOR ACCIDENTS.

On Thursday, July 10th, the House resumed consideration of the Road Traffic Bill as amended in the Standing Committee.

On Clause 10 (which deals with the rate of speed),

Colonel ASHLEY moved an amendment to empower the Minister of Transport, by regulations to be approved by resolutions of both Houses of Parliament, at some future time, if he thought fit, to vary the speed limit laid down in Schedule I. for commercial cars and heavy vehicles, but not to impose a speed limit on any vehicle in the case of which no speed limit was provided by the schedule.

Mr. MORRISON (Minister of Transport) said the proposal was sensible and rational in view of the possibility of changing conditions in the future, and he would accept it. His attention had been drawn by Mr. Harris, on behalf of the London County Council, to a doubt in their minds as to whether in the new circumstances it would be possible to make a variation in the speed limit in the case of the fire brigade and the ambulance services. He was advised that that power would remain. Any change necessary could be made when the Bill reached the House of Lords.

The amendment was agreed to.

On Clause 36 (requirements in respect of policies),

Major HILLS moved to leave out Subsection 2. He said that the Bill compelled the owner of a motor-car to take out an insurance policy covering him against third party risks, and it was provided in the subclause with which he was dealing that where payment was made on such a policy to a third party there should also be paid by the authorised insurers the expenses reasonably incurred by a hospital in affording treatment to an amount not exceeding £25 for each person treated. To call upon a motorist to pay by means of an insurance policy to a quite outside person money which he was under no legal liability to pay was the wrong remedy for the evil.

Colonel ASHLEY said that the hospitals wanted this provision, and that they were perfectly satisfied with it. Why should Major Hills know better than the hospitals?

Major HILLS said he objected to the provision because the hospitals were getting too little.

Colonel ASHLEY said he did not think that any answer to that objection was required. Lord Luke in the House of Lords had painted a very gloomy picture with no unduly heavy brush of the position of hospitals on the great arteries of traffic. The strain was severe on them, and the local population were excluded from their own institutions.

Mr. MORRISON said that the Government proposed to leave the decision in this matter to an entirely free vote of the House. He appreciated the need of the hospitals for money, and personally he had always taken the Socialist view that the scramble of the voluntary hospitals, which ran a public service, for voluntary contributions was a degrading business, and that the hospitals of this country ought to be run as a public health service. The motorist and the insurance company both had a right to be considered. This subsection was alien to this part of the Bill, whose sole object was to end, or substantially to end, the scandal of persons being injured or killed and not being able to get compensation. The objection to the subsection had been summed up in the House of Lords by Lord Atkin, who pointed out that a provision under which a policy of insurance involved a direct obligation upon an insurance company towards an unnamed hospital would be contrary to the whole principle of insurance, and that being so it was hardly to be wondered at that the subsection bristled with difficulties and anomalies. It was illogical, would be haphazard in its effect, and so extremely awkward to work in practice that it might be largely ineffective. It proposed to make provision for payment to hospitals only in certain cases. He agreed that the hospitals were burdened as a result of motor accidents, and he sympathised with them. But that was a problem of hospital finance which ought to be faced accordingly. The greatest difficulty in the subsection was that the liability for payment to the hospital depended on the fact of treatment in a hospital coming to the knowledge of the insurance company. There was no obligation to pay if it did not come to the knowledge of the insurance company, or of the owner of a vehicle in cases where a security bond had been taken out. It was obviously undesirable that a statutory right to payment should be based on such very uncertain foundations. The hospital authorities would have to find out whether the injured person in fact received compensation, and if so whether the motorist responsible was insured or was covered by a security bond, and the name of the insurer, if there was one, or in cases where a security bond had been taken out the name and address of the owner of the vehicle.

Their chances of finding out the name and address of the insured party would depend largely on whether evidence of compliance with the provisions of this part of the Bill was produced at the time when the accident occurred or not. Finally, they would have to find out whether the fact of treatment had been brought to the notice of the insurer, or to the owner of the vehicle in a case where a security bond had been taken out. In the Local Government Act, 1929, it was laid down that a person receiving treatment at a municipal hospital under the Act should pay according to his ability. That was honest and above board. If the voluntary hospitals had arrived at the point when they could no longer run on a voluntary basis it was not unreasonable for those hospitals to say, as municipal hospitals did, if their trust deeds would allow it, that if patients could afford to pay they should pay what they could afford for their treatment. That would have been logical and fair all round, but he could not say that this was fair. This agitation had been very fully conducted. He sympathised with those who for reasons which they all understood were anxious not to vote in such a way that they might be accused of voting against the interests of hospitals, but he would take that risk. He knew the pressure that had been brought to bear, he knew the honourable sentiment which existed in the matter, and he knew that the insurance companies had taken very few steps, if any, to put the other side of the case and defend their interests.

Dr. MORRIS-JONES said that the voluntary hospitals were going through a very difficult time, and he felt sure that the House would not deprive the hospitals of the very small amount of money which they would get under this Bill.

Dr. FORGAN said that the voluntary system of conducting hospitals, useful as it had been in the past, was now out of date, and the great majority of the hospitals were nearly bankrupt. The amount of financial support which the Bill would bring to them was very slight, and he entirely disagreed with the view of Dr. Morris-Jones that the House should do anything to subsidise a system which would very soon cease to exist.

Sir H. NIELD said surely motorists could pay a few shillings more on their policy in order to give some recompense to the hospitals who were striving so hard to make ends meet.

Mr. HOLFORD KNIGHT said they were not concerned with the present condition or the future conditions of voluntary hospitals, or with the merits or demerits of the voluntary system. In the main he confessed that he shared the view of the Minister on that subject, but that was not the issue in this instance. It was common knowledge that in recent years very heavy drains had been made upon the resources of the hospitals in respect of motor accidents. As the Bill made provision for some of these cases, as an act of justice to the hospitals he asked the House to resist the amendment.

Sir J. LAMB said this was in no sense an effort to obtain funds for the hospitals. It was merely an attempt to obtain payment for certain services which were forced upon the hospitals.

Mr. BEN GARDNER said he objected to a clause which permitted people to be compulsorily taxed in order to give funds to certain associations without having any voice in the management of those associations.

After further debate,

Major HILLS said he always had a great respect for the opinions of the House of Commons. He was persuaded which way the decision would go, and therefore he asked leave to withdraw his amendment.

The amendment was withdrawn and the further consideration of the Bill was adjourned.

HEALTH SERVICES IN SCOTLAND.

On Monday, July 14th, the House of Commons considered in Committee of Supply a vote to complete the sum of £2,791,592 required for the salaries and expenses of the Department of Health for Scotland. Mr. W. ADAMSON (Secretary of State for Scotland), in moving the vote, reviewed the work of the department during the past year, and there was a general debate on a variety of subjects of medical importance. A report of the debate will be published in THE LANCET next week.

HOUSE OF LORDS.

WEDNESDAY, JULY 9TH.

Assessment of Playing Fields.

Lord O'HAGAN asked His Majesty's Government—

Whether their attention has been drawn to the serious increases which have recently taken place in the assessmen of playing fields and recreation grounds for the use of villagers or attached to working-men's clubs, settlements, churches, and institutes; whether it is realised that the effect of the increased assessments will probably involve the giving up of many private playing fields because the present occupiers cannot pay the increased rates; and whether, in view of the importance of securing recreational facilities for developing the health and healthy enjoyment of the wage-earning classes in particular, it is intended to take any measures to relieve from the payment of rates and taxes bona fide non-profit-making playing fields for those who otherwise are unable to afford them.

The noble lord, who also moved for papers, said that under the reassessments which were taking place land was being assessed which had never been assessed before, and where the land was already subject to rates the assessments were in many cases being increased. Money was being raised in this way at the expense of health and recreation, and some of the sports clubs would have to double their subscription, which the membership could not afford, or cease to exist. These assessments were undoing a great deal of the work which had been done by the National Playing Fields Association, which had rendered splendid service.

The motion was supported by Lord DANESFORT, the Earl of DERBY (chairman of the committee of the National Playing Fields Association), and the Bishop of SOUTHWARK.

Lord MARLEY (Under Secretary for War), replying for the Government, said he was told that it was not at the desire of the National Playing Fields Association that this question was raised, in view of the fact that the Minister of Health was meeting that Association on the following day to discuss this subject with them in a very sympathetic manner. They must try to find a remedy for the effects of the Rating and Valuation Act, 1925, which attempted to stabilise and equalise the assessment of rates all over the country. The information obtained by the Central Valuation Committee appeared to show that in most of the counties and county boroughs concerned the proportionate increase in the assessments of playing fields had been less than the general proportionate increase in rateable value. He had no doubt that the Central Valuation Committee would be able to do much to meet the points that had been raised. Such information as the Government had did not suggest that any financial difficulties would follow the new assessments in the majority of cases. The Ministry had no evidence that any playing fields had been given up owing to the new assessments. A Bill to exempt playing fields from rating was defeated in Committee after having been opposed by the Association of Municipal Corporations, the County Councils' Association, and many other bodies. The Minister of Health was of opinion that the anomalies in the assessment of playing fields were in the same category as the assessment of other properties, such as hospitals and schools. The recommendations of the Central Valuation Committee would undoubtedly carry very great weight with the local authorities, and they would be published. It must be the unanimous wish of their Lordships to find a solution of these difficulties and to increase the number of playing fields, but they must not

consider that because one solution was put forward it was necessarily the right one.

Lord O'HAGAN, after expressing disappointment with the reply, withdrew his motion for papers.

HOUSE OF COMMONS.

WEDNESDAY, JULY 9TH.

Miners and Nystagmus.

Mr. TINKER asked the Home Secretary if his attention had been drawn to the increasing number of nystagmus cases certified for light work on the surface; if he was aware that employers refused to find them suitable work but reduced compensation to small amounts and, in some cases, took it away altogether; and if he would consider amending the Workmen's Compensation Act so as to prevent compensation being reduced until suitable work was offered. —Mr. CLYNES replied: I am well aware of the hardship arising not only in nystagmus cases but also in the case of many other partially disabled workmen, who under present conditions are unable to obtain any suitable employment. An attempt to provide a solution has been made this session in a Bill which is now before the House. I am afraid that all I can do at present is to assure my hon. friend that I recognise the importance and urgency of the question, and will do anything that is possible to secure a satisfactory settlement.

Mr. DUNCAN GRAHAM asked the Home Secretary whether he was aware that the coalowners of Lanarkshire made it a condition of employment that every man employed by them to work underground should sign a form that he had never been in receipt of compensation for nystagmus; if the man stated on the form that he had been on compensation for that disability he was refused employment; if he denied having suffered from nystagmus for the purpose of getting employment and the disability recurred he was deprived of compensation; and whether, as this was in effect an evasion of the Workmen's Compensation Act, he would take action to make the signing of such a form illegal.—Mr. CLYNES replied: I understand that the practice in the Lanarkshire coalfield is generally as described in the question. It would, I think, be unfortunate if all the men who had at any time suffered in any degree from miner's nystagmus should be debarred thereafter from any underground employment, and I propose to consult with my hon. friend the Secretary for Mines as to the possibility of arriving at some special arrangement with the industry in regard to the application of the Act to such cases.

Welfare of the Blind.

Sir KINGSLEY WOOD asked the Minister of Health whether he proposed to take any action concerning the recommendations in the recent report of the advisory committee on the welfare of the blind.—Mr. GREENWOOD replied: I am not sure what particular recommendations the right hon. gentleman has in view. Most of the recommendations contained in this report do not call for any action on my part.

Report on Maternal Mortality.

Dr. PHILLIPS asked the Minister of Health when the report of the departmental committee inquiring into the causes of maternal mortality would be published.—Mr. GREENWOOD replied: It is hoped that an interim report from this committee will be published before the end of this month.

Specimens at Royal Veterinary College.

Mr. RICHARD RUSSELL asked the Minister of Agriculture if he was aware that some thousands of pathological specimens of great value, on account of their rarity, had been destroyed at the Royal Veterinary College, London; and whether he proposed to make any inquiry into this loss to veterinary education and research.—Dr. ADDISON replied: I am not aware that the position is as stated in the first part of the question. According to my information, certain specimens at the College were destroyed as they were no longer in good condition. I understand that the governors of the College have already considered this question, and I can scarcely intervene in the matter.

Nourishment for Necessitous Children.

Mr. DAY asked the President of the Board of Education the number of local authorities at present providing meals and other nourishment for necessitous children; and what arrangements had been made for securing coöperation between the education and poor-law authorities.—Sir CHARLES TREVELYAN replied: 135 local education authorities provided meals for school-children during the week ended June 21st. With regard to the second part of the question, arrangements are generally made for securing coöperation by means of mutual exchange of information.

Dental Examination and Loss of Wages.

Mr. BOWEN asked the Minister of Health whether, in view of the fact that provisions of the National Health Insurance (Dental Benefit) Regulations, 1930, made provision that, as from July 7th next, a condition for the receipt of dental benefit was that a member of an approved society must, if required by his society, submit himself for examination both before and after treatment, and in consideration of the loss of wages likely to be incurred by members of approved societies in connexion with such attendances, he would consider amending such proposed regulations so as to provide for payment of actual loss of wages incurred by applicants who attended for such examinations.—Mr. GREENWOOD replied: There is no necessity for an insured person to suffer any loss of wages by reason of attendance for examination by a regional dental officer, as arrangements can aways be made, if necessary, for his examination outside his working hours. In these circumstances I do not think that any amendment of the regulation referred to by my hon. friend is required.

TUESDAY, JULY 15TH.

Medical Attention for Families of Service Men.

Mr. HORE-BELISHA asked the Secretary of State for War what arrangements were in force for providing medical attention for the families of officers and men serving in the Army.—Mr. T. SHAW replied: The following is the information asked for: The families of officers and soldiers on the married quarters roll are afforded medical attendance as a privilege so far as facilities are available from a military source. At practically all military stations there is a military medical officer or employed civilian medical practitioner whose duties include medical attendance on officers' and soldiers' families. If unfit to attend the medical inspection room, families on the married quarters roll may be attended in their quarters provided they reside within a radius of one mile from a point fixed by the general officer commanding (usually the medical inspection room). At certain stations where the strength of the garrison is large in comparison with the civil population, there is a military families' hospital to which the families of soldiers on the married quarters roll may be admitted. At stations where there is no military families' hospital a member of the family of a soldier on the married quarters roll may, in special circumstances, be admitted to a civil hospital at the cost of army funds. Hospital accommodation is not provided for the families of officers, but the families of officers in the Salisbury Plain area, and at Ismailla, where the local conditions are exceptional, may be admitted to the local military families' hospital on payment of the usual hospital charges, provided accommodation is available. At Aldershot a wing has been added to the military families' hospital, at the cost of local charitable funds, for the accommodation of the families of officers in that command. The charges for admission to this wing are fixed by the local committee, and all additional expense in connexion with the wing is borne by the committee. Families of soldiers not on the married quarters roll may also have such facilities as are available, but they cannot be visited at their residences by a medical officer. They may, under the special authority of the general officer commanding, be admitted to a military hospital on payment of 1*s.* a day.

Street Accidents to Children in London.

Mr. DAY asked the Home Secretary the number of street accidents to children in London (Metropolitan Police District and City of London) for the 12 months ended to the last convenient date.—Mr. CLYNES replied: The figures for the 12 months to March 31st last are, killed 297, and injured 10,944.

Health of the Mercantile Marine.

Mr. THOMAS LEWIS asked the President of the Board of Trade what progress had been made by the joint committee set up 12 months ago to consider and advise on any questions affecting the health of the mercantile marine; and when a report on the subject was likely to be made.—Mr. W. GRAHAM replied: The inquiries into the mortality statistics of seamen and the hygiene of crew spaces are making satisfactory progress, but it must necessarily be some time before the committee can complete its consideration of these problems.

SUBSIDISED AND NON-SUDSIDISED HOUSES.—In reporting a reply of the Parliamentary Secretary to the Minister of Health to a question by Mr. Hore-Belisha last week (July 12th p. 112), a tabular statement was inserted in which, by obvious error, columns 2 and 3 were transposed.

OBITUARY

FRANK EDWARD TAYLOR, M.D., M.R.C.P.Lond., F.R.C.S.Eng.

Dr. Frank Taylor, who died suddenly on July 1st, aged 58, was born in Leeds, the son of an Iron-founder, and was educated at the Leeds Boys Modern School. Entering the Yorkshire College (Victoria University), Leeds, he graduated first in arts and then in medicine. After experience as house surgeon at the Leeds General Infirmary he decided to specialise in obstetrics and gynæcology, and took up resident appointments at the Hospital for Women and Children, Leeds, and the Chelsea Women's and Queen Charlotte's Hospitals, London, besides working in Berlin during 1899. The Boer War interrupted his studies and in 1900 he joined the South African Field Force as civil surgeon, receiving the medal and three clasps for his services.

On his return Dr. Taylor pursued further studies in his chosen subject and added to the number of his qualifications by taking the F.R.C.S. Eng. in 1903, the M.R.C.P. Lond., in 1905, and the M.D. Lond. and D.P.H. Camb., in 1906; all his life he had a flair for passing examinations and for coaching others to do so. Appointments as gynæcologist on the staff of the North-West London and Hampstead General Hospital, the St. Marylebone General Dispensary, and the Eastern Dispensary now followed, and he seemed well embarked on the career he had chosen when he was compelled by ill-health in 1912 to relinquish his gynæcological work. He had been appointed in 1906 part-time demonstrator and then lecturer in the bacteriological department at King's College, London, and devoted the remainder of his life to bacteriology and pathology. During the war he was pathologist to the Lewisham War Hospital and for some years pathologist to the Royal Westminster Ophthalmic Hospital in addition to his King's College appointment.

Dr. Taylor won the admiration of his friends by his fight against ill-health and the disabilities ensuing therefrom. He had considerable literary ability and originality of ideas and published a number of useful communications. In the earlier part of his career these were mainly gynæcological, but later they ranged over widely separate subjects. With Prof. Dixon and Dr. Rosenheim he investigated the action of placental extract and he published papers on the Arneth blood count, vaccines, the absorption test, besides other work in collaboration with Sir Aldo Castellani, Capt. McKinstry, and Dr. Pickering. For many years he was an examiner on the Central Midwives Board and for the last 18 months was in charge of the vaccine laboratory of the Royal Herbert Hospital. He leaves a widow but no family.

GAVIN BROWN CLARK, M.D.Brux., F.R.C.S.Edin.

Dr. Gavin Clark, who died at Hampstead on July 5th, at the age of 83, was better known as a politician than as a medical man. After practising for a few years in London he was, in 1885, elected M.P. for Caithness, and identified himself with the Radical wing of the Liberal Party. The interests of his native Scotland had appealed strongly to him, and he played an active part in the passing of the Crofters' Act which had for its objects the relief of distress in the Highlands. Home Rule for Ireland also found in him a staunch supporter, and he was throughout his life a vigorous worker in the cause of international peace. Dr. Clark was for ten years Consul-General to the South African Republics and during the Boer war he was bitterly attacked for his opposition to that conflict—an attitude which cost him his seat in 1900. During the late war he was an active member of the Wounded Allies' Relief Committee, which had established hospitals in France and Serbia, and for his services he received the Belgian Order of the Crown and the Serbian Order of St. Sava. Dr. Clark was a keen socialist, a great traveller, and a man of wide sympathies. Mr. Ramsay MacDonald writes of him: "He has had a long and very useful life, and his name will always be associated with two great causes which he served with singular devotion—the Highlands and Peace." He leaves a widow with one son and a daughter, Mrs. W. A. Brend. A younger son, Captain W. B. Clark, R.A.M.C., was killed in the war.

MEDICAL NEWS

University of Dublin.

At recent examinations the following candidates were successful:—

M.D.

C. de L. Shortt and J. E. Wells.

M.CH.

N. L. W. Woodroffe.

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Part I. Therapeutics, Hygiene, Pathology, &c.—L. L. Nel, J. L. du Preez, T. F. O'Donnell, Alfred Pollitt, Sydney Brass, A. L. Pennefather, E. W. West, P. P. Murphy, C. de V. Shortt, I. G. M'Intyre, Lambertus Lambinon, P. H. Stone, M. A. Shapiro, and Robert M'Neilly.

Part II. Medicine.—*S. H. Moore, N. A. Kinnear, A. H. Thompson, J. T. Robinson, T. A. Bouchier-Hayes, W. A. Robinson, E. S. Duthie, J. M. Gibbon, Reginald Bowesman, J. B. Scott, E. S. Tweedy, H. W. Dalton, R. D. Scott, Ruth R. Armstrong, J. E. R. Keyms, and A. A. Lisney.

Surgery.—*S. H. Moore, J. T. Robinson, J. M. Gibbon, A. H. Thompson, J. A. Dowds, T. H. Dockrell, T. A. Bouchier-Hayes, W. I. Chapman, N. S. Klass, A. H. O'Malley, P. L. O'Neill, Aaron Rakoff, R. P. M'Garrigle, and D. G. M'Caully.

Midwifery.—*P. C. Cosgrove, G. F. Ennis, Charles Bowesman, A. D. Egan, Alice V. Cunningham, A. J. O'Connor, H. St. G. Smith, D. G. Kennedy, and P. H. Peacock.

* Passed on high marks.

D.P.H.

Part I.—J. H. Bowyer, and P. J. Maguire.

Part II.—J. H. Bowyer, P. J. Maguire, W. H. Sexton, D. H. F. Milmo, and May F. M'Carthy.

University of Durham.

On June 26th and 27th the following degrees, diplomas, and licence were conferred:—

M.D.—E. C. Abraham, P. C. Arnold, Joshua Carse, J. A. Charles, Anne Fairweather, David Gamsu, H. V. Leigh, G. N. Myers, H. P. Nelson, S. D. Rowlands, J. M. Tait, Sydney Thompson, James Whillis, and (for practitioners of 15 years' standing) A. O. Gray.

M.B. and B.S.—H. H. D. Anderson, B. N. Bhandari, R. H. Clayton, Edna T. Everdell, P. N. Grinling, Lily Haugh, William Hunter, J. G. Lawson, Robert Manners, Thelma Mouat, Samuel Olswang, H. J. Peters, W. G. A. Swan, and J. E. Wilson.

B.Hyg. and D.P.H.—T. H. Blench, Jessie S. Dunlop, Annie M. C. Forster, R. G. A. McLaren, and E. T. Riordan.

L.D.S.—T. A. Ireland.

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B. AND B.S.

Pathology, Pharmacology, Public Health, &c.—W. C. D. Bewick, Eileen G. Marshall, J. A. Miller, A. H. Penman, and Edward Smith.

University of London.

At recent examinations the following candidates were successful:—

DIPLOMA IN BACTERIOLOGY.

Y. B. Abdoosh, H. R. Aggarwal, C. G. Anderson, J. G. C. Campbell, James Carmichael, F. P. Coyne, S. R. Pandit, and R. S. Twigg.

Royal College of Surgeons of England.

A quarterly meeting of the Council was held on July 11th, with Lord Moynihan, the President, in the chair.

The President announced the re-election to the Council of Mr. R. P. Rowlands, Sir Percy Sargent, and Mr. Victor Bonney. The newly elected members were introduced and took their seats in the Council. Lord Moynihan was re-elected President, and Mr. C. H. Fagge and Mr. R. P. Rowlands were elected vice-presidents for the ensuing year. Mr. R. H. Burne, F.R.S. (physiological curator), Sir Frank Colyer (honorary curator of the odontological collection), and Mr. C. J. S. Thompson (honorary curator of the historical section of the museum) were re-elected to their respective posts.

Mr. W. R. Le Fanu, the assistant librarian, was appointed librarian to the College from Oct. 1st next. Mr. E. G. Muir, M.R.C.S., was appointed Bernhard Baron research scholar. The Hallett prize for anatomy and physiology was awarded to George Qvist, of University College Hospital. It was announced that the Sir Gilbert Blane gold medal had been awarded to Surgeon Lieut.-Commander J. F. H. Gaussen, R.N.

D. S. M. Barlow, of Middlesex and University College Hospitals, was admitted a Fellow of the College, and diplomas of Membership were granted to R. D. Harding (King's College Hospital) and Violet R. Sharp (Royal Free), who had passed the necessary examinations and complied with the regulations.

Licences in dental surgery were granted to the following:—

A. H. Adcock, A. A. W. Beach, A. S. Bradshaw, S. H. Brown, J. J. Cochrane, G. R. G. Druce, F. A. Dyer, W. D. P. Evans, William Forsyth, Millice A. Freeman, A. H. Fuller, Julius Gottlieb, W. F. G. Harvey, Bernard Herson, L. B. Hilton, S. C. Holms, E. C. Humphreys, J. W. Jessen, H. S. Johnson, H. A. W. Lincoln, W. R. R. Mewton, G. E. Pedley, K. E. Pringle, G. B. Schofield, C. R. K. Smith, S. R. Smith, J. J. Stack, Louis Symonds, K. V. M. Taylor-Milton, C. G. Wadsworth, L. G. White, D. S. Wilson, and T. D. Wren.

Diplomas in psychological medicine were granted jointly with the Royal College of Physicians to 10 candidates, and diplomas in laryngology and otology to 17 candidates.

The Council elected the following professors and lecturers for the ensuing year:—

Hunterian Professors: Sir Arthur Keith (six lectures), Mr. Victor Bonney, Mr. Basil Hume, Mr. J. Paterson Ross, Mr. D. H. Patey, and Mr. J. W. Tudor Thomas.

Arris and Gale Lecturers: Mr. T. P. Dunhill, Dr. Donald Hunter, and Prof. H. H. Woollard.

Erasmus Wilson Lecturers: Mr. C. E. Shattock, Mr. C. P. G Wakeley, Mr. D. H. Patey, and Mr. R. T. Payne.

Arnott Demonstrator: Sir Arthur Keith.

Vacant Erasmus Wilson demonstratorships are to be advertised.

The President reported that Dr. Harvey Cushing, of Boston, U.S.A., had delivered the Lister memorial lecture on July 9th, and had unveiled a tablet in memory of the late Sir Anthony Bowlby, presented by some American surgeons who had been associated with him during the late war. Mr. L. Bathe Rawling, on behalf of the medical staff of St. Bartholomew's Hospital, presented to the College a copy of Sir William Llewellyn's portrait of the late Sir Anthony Bowlby.

Sir D'Arcy Power, the honorary librarian, presented to the Council, on behalf of the editors, the two volumes of Plarr's "Lives of the Fellows." The Lives may be obtained from Messrs. John Wright and Sons, Ltd., of Bristol, price 3 guineas (leather) or 2 guineas (cloth) for the two volumes.

The Council appointed the following assessors and officers, nominated by the Canadian Medical Association, for the primary examination for the Fellowship to be held at Montreal from Sept. 2nd to 5th:—

Assessor for Anatomy: Prof. S. E. Whitnall, McGill University.
Assessor for Physiology: Prof. John Tait, McGill University.
Superintendent of the Examination: Dr. J. C. Simpson.
Superintendent of Dissections: Prof. John Beattie.

A primary examination for the Fellowship is to be held in Australia in August or September, 1931.

Thursday, Nov. 13th, was fixed as the date of the Buckston Browne annual dinner of Fellows and Members.

Royal College of Surgeons of Edinburgh.

The following diplomas have been conferred:—

L.D.S.—I. B. MacQuarrie, R. K. N. Clarkson, W. B. Taylor, and M. N. Paterson.

University of Sheffield.

At recent examinations the following were successful:—

FINAL EXAMINATION FOR M.B., CH.B.

K. G. A. Barlow, M. B. Hallam, Firth Hudson, Constance N. Jenkinson, W. H. B. Moore, and Ethel H. Waddy.

Dr. John Rennie has been appointed Professor of Public Health, in place of the late Dr. F. E. Wynne. Dr. Rennie is Dr. Wynne's successor as medical officer of the city of Sheffield.

London School of Hygiene and Tropical Medicine.

In the recent terminal examinations of the Division of Tropical Medicine and Hygiene the following candidates were successful:—

Passed with Distinction.—A. B. Cook (Duncan medal), T. F. Anderson, W. K. Connell, D. R. McPherson, E. N. O'Neill, C. E. Roberts, R. G. Spink, D. E. Stewart, M. V. N. Sudds, and H. G. Timbres.

Passed.—C. A. Alvarado, E. Burton, G. Q. Chance, P. J. Cowin, B. P. Dutt, M. A. Gaffer, D. R. Griffith, L. R. Khan, A. H. H. El Kordi, E. M. Lourie, F. H. McCay, F. Marsh, E. C. W. Maxwell, D. Murray, T. H. Nolan, P. K. Rao, R. Shelley, H. M. Soar, T. W. Stephens, B. A. Taylor, W. F. O. Taylor, S. E. Theis, G. M. Tullidge, H. B. C. Wallace, E. M. Wijerama, W. H. Willis, E. D. B. Wolfe, and K. Wood-Martin.

University of Aberdeen.

On July 9th the following degrees were conferred:—

M.D.—**H. W. Mulligan, *J. R. W. Hay, *John Innes, *J. W. Lobban, Duncan Coutts (*in absentia*), R. P. Gammie.

Ch.M.—*Charles Donald.

** Honours for thesis.
* Commendation for thesis.

M.B. & Ch.B.—*J. W. Howie, *Ann L. Thomson, N. D. Allan, P. E. Attisha, A. R. Forrest, C. J. M. Geddes, C. A. Glass, Gordon Hutchison, I. D. Kitchin, A. D. Macdonald, G. D. McKenzie, John Morrice, J. M. Ritchie, C. W. Robertson, John Seed, L. G. Shearer, H. M. Sinclair, J. R. Slessor, Anne Smith, R. A. Stephen, M. L. Thomson, J. W. E. Webster, and W. D. Wilson.

D.P.H.—V. L. Ferguson.

* With second-class honours.

University of Liverpool.

Applications are invited for the Samuel Turner Fellowship of £600 a year for research on cancer, in the first instance by tissue culture. Particulars will be found in our advertisement columns.

Royal Institute of Public Health.

Lord Reading has accepted the Presidency of the congress of the institute to be held at Frankfurt in May, 1931.

Trinity College, Dublin.

Miss Sarah H. Purser has given a sum of money to bring in £100 per annum in order to found a lectureship as a memorial to her brother, the late Dr. John Mallet Purser, who held the Chair of the Institutes of Medicine in the School of Physic for 27 years, and was for eight years Regius Professor of Physic. Several years ago Dr. Purser made a gift of £10,000 for the advancement of medical and scientific teaching in the University, and the interest on this sum has been the means of providing additional apparatus for teaching.

Donations and Bequests.

The late Mr. George Frederic Grant, J.P., of Kingston-on-Hull, among other bequests, left £500 each to the Hull Royal Infirmary and the Victoria Hospital for Sick Children, Hull; £100 each to Hull, East Yorks, and Lincolnshire Institution for the Deaf and Dumb, the Hull Blind Institution, and the Hull Jubilee District Nursing Association.—By the will of Mr. Aba Mickler, of Newcastle-on-Tyne, a bed is to be endowed in the Royal Victoria Infirmary and the residence of the testator is to be used as a hospital for poor consumptives and poor persons suffering from diseases of the chest, to be known as "The Northern Counties Hospital for Diseases of the Chest" and incorporating the name of Aba Mickler. The Hospital for Diseases of the Skin, the Hospital for Diseases of the Throat and Ear, Newcastle-on-Tyne, the Hospital for Incurables, the Northern Counties Hospital for Diseases of the Chest, the Northern Counties Institution for the Deaf and Dumb are recommended in the will for consideration by the trustees.—By the will of Mr. John Charles Gray, of Barr Common, near Walsall, who left estate of the gross value of £34,425, with net personalty £33,589, the testator left £500 to the Walsall and District General Hospital. After other bequests the residue of the property will go to the British Red Cross Society, to be applied by them in and towards their British Empire Cancer Campaign Fund.

Opening of the Marie Curie Hospital.

The Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W., whose construction and accommodation have been fully described in the pages of THE LANCET, was formally declared open on Thursday, July 10th, when Mr. Stanley Baldwin performed the ceremony in the presence of a large number of supporters and friends of the institution. Miss M. M. Chadburn, M.D., senior surgeon to the South London Hospital for Women, and chairman of the Cancer Research Committee of the London Association of the Medical Women's Federation, presided, and among others present on the platform were the French and Polish Ambassadors, the Lady Mayoress of London, Mrs. Baldwin, Prof. Winifred Cullis, Sir Cuthbert Wallace, Lady Briscoe, and Prof. E. H. Kettle. Miss Chadburn, in welcoming Mr. Baldwin, said that the Marie Curie Hospital was the institution organised in England by medical women for the radium treatment of women suffering from cancer and allied diseases, and was the first establishment of its kind. She briefly summarised the reasons why the hospital had come into existence, the main one being to carry on the treatment of cancer of the uterus in accordance with the lines adopted at leading clinics on the Continent. She gave the statistics relative to the incidence of cancer on the whole population and on women, where the prevalence of uterine cancer was stressed. The fact, she said, that the radium treatment gives hope of cure, in cases taken at an early stage, justified both their present activities as well as an appeal for more money to provide more beds. The hospital possessed 30 beds, and at least 50 were required, for "cancer patients cannot wait." They had been lent radium to the value of £12,000, and it was never idle.

Mr. Baldwin expressed his pleasure at identification with the movement, and declared that to politicians, who spent their lives in controversy, who lived in the dust of the world and worse, and daily saw the exposure of meanness and sordidness, an escape to an atmosphere of complete unselfishness was to bathe in a sweet and pure stream of English life. Those who worked in the treatment of disease by radium had no thought of wealth, and were prepared to sacrifice their health and even their lives in the attempt to harness the wonderful substance to the service of mankind, facing the eternal verities of life, death, and truth. The Marie Curie Hospital he regarded as a memorial to this work, and to that band of martyrs, the early radiologists. In the researches to be carried on there by women, it might be that the supreme honour would be earned of discovering the origin of cancer, but who made the final discovery did not matter, for all who toiled to that end shared the honour.

The French ambassador read a telegram of good wishes from Mme. Curie, and eulogised her scientific work when associated with her French husband; and the Polish ambassador described how Mlle. Sklodowska derived from her Warsaw teaching and upbringing a scientific background.

Mr. Baldwin then declared the hospital open.

A vote of thanks to Mr. Baldwin was proposed by the Lady Mayoress, who recalled the support given at a Mansion House meeting to the scheme for adding to the hospital. This vote was seconded by Prof. Winifred Cullis, who pointed out the similarity of Mr. Baldwin and Miss Chadburn in their studiously moderate manner of stating important things, when Mr. Baldwin replied that, "to employ meiosis," he felt not unhonoured.

The front door of the hospital was then unlocked by Mr. Baldwin with a key presented to him by Miss E. Scott, A.R.I.B.A., the architect.

Middlesex Hospital Medical School.

The opening ceremony of the winter session will take place at the Queen's Hall, Langham-place, on Oct. 1st at 3 P.M. Mr. Arthur Greenwood, Minister of Health, will distribute the prizes, and Mr. Eric Pearce Gould will give the introductory address. The annual dinner of past and present students will be held at the Savoy Hotel in the evening.

Appointments

BOYLE, A. B., M.B., B.Ch. Belf., has been appointed Medical Officer of the No. 2 Londonderry Dispensary.

BROWN, F. W. C., M.D. Aberd., Medical Officer of Health and Schools Medical Officer at Hyde.

Certifying Surgeons under the Factory and Workshop Acts: BOSCHI, E. J., L.R.C.P. Lond., M.R.C.S. (Bruton, Somerset), and WILSON, C. L. L., L.R.C.P. Lond., M.R.C.S. (Sittingbourne).

HEATH, W. E., M.B., B.S. Lond., D.O. Oxf., Hon. Ophthalmic Surgeon to St. Bartholomew's Hospital, Rochester, and to the Gravesend and North Kent Hospital, Gravesend.

WRIGHT, W. E. M., F.R.C.S. Edin., Medical Officer to the Boston (Lincolnshire) Poor Law Institution.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 21st to SATURDAY, July 26th.—INFANTS HOSPITAL, Vincent-square, S.W. Special Course in Diseases of Infants. Every afternoon from 2 P.M., Lectures and Demonstrations. Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, July 21st.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Children's Diseases Clinics. Operations.

WEST LONDON POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, July 21st.—10 A.M. to 1 P.M., Skin Department, Genito-urinary Operations, Surgical Ward Visit. 2 P.M. to 5 P.M., Operations, Surgical Ward Visit, Medical, Surgical, Eye, Gynæcological Out-patient Departments.

TUESDAY.—10 A.M. to 1 P.M., Medical Ward Demonstration, Surgical Clinical Demonstration. 2 P.M. to 5 P.M., Operations, Medical, Surgical, and Throat, Nose and Ear Out-patient Departments.

WEDNESDAY.—10 A.M. to 1 P.M., Medical and Surgical Ward Visits. Children's Medical Out-patient Department. 2 P.M. to 5 P.M., Gynæcological Operations, Medical, Surgical, and Eye Out-patient Departments.

THURSDAY.—10 A.M. to 1 P.M., Neurological Department. Demonstration in Treatment of Fractures. 2 P.M. to 5 P.M., Medical, Surgical, Eye, and Genito-urinary Out-patient Departments. Operations.

FRIDAY.—10 A.M. to 5 P.M., Medical Ward Visit. Skin and Dental Out-patient Departments, Medical Clinical Demonstration. 2 P.M. to 5 P.M., Medical, Surgical, and Throat, Nose and Ear Out-patient Departments. Operations.

SATURDAY.—10 A.M. to 1 P.M., Children's Medical, Bacterial Therapy, and Surgical Out-patient Departments, Medical Ward Visits, Throat, Nose and Ear Operations.

Births, Marriages, and Deaths

BIRTHS.

ALLEN.—On July 10th, at Hillbury-road, S.W., the wife of Dr. N. Howard Allen, Woolwich, of a son.

CARDELL.—On July 6th at Devonshire-street, W., the wife of J. D. Magor Cardell, F.R.C.S., Burgess Park-mansions, N.W., of a daughter.

MURPHY.—On July 7th, the wife of Dr. Denis Murphy, Earlsfield-road, Wandsworth Common, S.W., of a son.

MARRIAGES.

CHIESMAN—RENNIE.—On July 12th, at Holy Trinity, Brompton, Walter Eric Chiesman, M.A., M.B., M.R.C.P., to Féodora Rennie, younger daughter of the late Frank Rennie, M.D., of Sway, Hampshire, and Mrs. Rennie, Princes-gardens, S.W.

McILRAITH—WOODS.—On July 10th, at All Souls, Langham-place, W., Charles H. McIlraith, M.D., &c., Harley-street, and Half-Moon lane, S.E., to Eileen Valerie Woods, daughter of the late E. MacAlpine Woods, J.P., &c.

SEWARD—MURPHY.—On July 10th, at the Catholic Church, Okehampton, Charles Mackay Seward, M.D., M.R.C.P. Edin., to Anne, elder daughter of Mr. and Mrs. F. Murphy, of Exbourne, Devon.

SPOOR—PATTISON.—On July 7th, at Oxford, William H. Spoor, M.A. Camb., M.R.C.S., L.R.C.P., to Sybil de H. R. Pattison, M.R.C.S., L.R.C.P.

WHIMSTER—EDWARDS.—On July 5th, at St. Mary's Church, Crumpsall, William Swanson Whimster, M.D., M.R.C.P., of Glendarroch, Lenton Boulevard, Nottingham, to Madge Elizabeth Edwards, M.B., Ch.B., younger daughter of Mr. and Mrs. F. F. Edwards, of Crumpsall, Manchester.

DEATHS.

ASHWORTH.—At Worthing, on July 11th, James Henry Ashworth, M.D., late of Halstead, Essex, aged 82.

BELL.—On July 9th, at Polwarth-grove, Edinburgh, after a long illness, Colonel George James Hamilton Bell, C.I.E., I.M.S. (retired), aged 69.

BULL.—On July 11th, at a nursing home in London, after a short illness, Lt.-Col. George Henry Bull, M.D., late of the I.M.S., of Monte Carlo, and of the Badminton Club, aged 77.

PRIOR.—On July 8th, at Darlington, Miles Prior, M.B., B.S., Surgeon, late R.N. and ss. *Olympic*.

SMITH.—On July 13th, after a long illness, at Lyncroft, Otford, Kent, Lt.-Col. Sydney Browning Smith, C.M.G., I.M.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

REFLECTIONS ON THE TREATMENT OF PULMONARY TUBERCULOSIS

IN SWITZERLAND AND AT HOME.

By W. R. E. Harrison, M.R.C.S. Eng.,

LATE HOUSE PHYSICIAN, CITY OF LONDON HOSPITAL FOR DISEASES OF HEART AND LUNGS, VICTORIA PARK, E.

In my belief a tuberculous patient is more likely to recover if he remains in England than if he goes to the high Alps, and I think the time is ripe for reconsideration of a form of treatment which has become traditional. The observer who has time for only a short visit to the Alps may easily overlook factors which are important in determining which environment offers the best chance of successful treatment.

Switzerland as a Holiday Resort.

The reputation of Switzerland for winter sports is, of course, increasing. On all sides there are glowing accounts of the invigorating effect of its wonderful dry and sunny climate, and judging by the appearance of returning enthusiasts this praise is well deserved. The danger lies in assuming that what is good for the holiday-maker is also good for the consumptive.

There is too much loose talk about "plenty of fresh air and sunshine" as though these were the most important elements in the treatment of tubercle. Undoubtedly the fresh air idea when it was first introduced marked a big step forward, and the whole sanatorium régime has evolved from it. But further advance has been made since then and fresh air no longer holds the first place. In fact, it can be confidently stated that by itself fresh air is not of much use, and may even be indirectly harmful if the patient is led to believe that by living in fresh air he is doing all that is necessary.

As to sunshine, it is difficult to see why this should be recommended at all during the active stages of the disease, since we are well aware of its power for harm, while any good that it may do is not proven. The present craze for sunshine and sun bathing should make medical practitioners careful to warn their phthisical patients against its risks. If only the slogan "plenty of fresh air and sunlight" could be lived down and replaced by some such phrase as "rest, prescribed exercise, and a healthy environment," in that order of importance, the public would become more familiar with the therapeutic methods of the present day and the alleged advantages of Switzerland would receive more careful scrutiny.

It may be suggested that Alpine life stimulates metabolism and increases the number of red cells in the blood; or even that the dry air "dries up" the sputum or fluid from a pleural effusion; but these are not the real reasons responsible for faith in Switzerland. The truth is that we carry in our minds a picture of the high Alps based on the recollection of a pleasant holiday spent in that country, probably in January. Weather conditions in London or in any other big English town at that time of the year were probably bad, and contrasted unfavourably with the clear brilliant air of the mountains. The cold air invited strenuous exercise, and the combination of exciting exercise, sunshine, and novel scenery caused an increase of the appetite and a sense of well-being. Little wonder then that we are apt to be biased in favour of the Alpine towns as health resorts. But these agreeable assets, far from being available for tuberculous patients, actually entail certain disadvantages and hindrances to successful treatment.

Sanatorium Life in Mid-winter.

Let us consider the life of a patient in a Swiss sanatorium during the twelve mid-winter weeks—a period chosen because it is said to be the time when Switzerland enjoys the greatest advantage over England.

First, there are the physiological considerations already mentioned—viz., stimulation of metabolism and an increased red cell count. But these are not really very important. Although metabolism no doubt rises in holiday-makers, there is little reason to expect the same result in patients. It must be remembered that in winter 19 out of the 24 hours of each day must be spent strictly within doors, in rooms centrally heated and poorly ventilated. The reason for this is that the sun is only visible over the mountain tops for about five hours a day, and for the remaining 19 hours the cold is too severe to permit of sitting outside. Patients are not advised, for the same reason, to open their bedroom windows. In a way this is all to the good, since tuberculous toxins are themselves powerful stimulators of metabolism, and the patient may well be able to dispense with further stimulation.

As for the increase of red cells in the blood, I cannot see how this can have any therapeutic value. Is it not simply a compensatory measure to overcome the disadvantage which otherwise would result from the shortage of oxygen in the air? If compensation becomes complete the patient is no worse off than he was before coming up to an altitude of 5000 feet. If, on the other hand, the destructive toxins prove too much for the regenerating processes, complete compensation is not attained and the patient is compelled to live in a state of chronic anoxæmia.

Occupation and Outlook.

We now come to more important considerations.

One of the tests of a good sanatorium is its capacity to provide cheerful, health-giving interests suitable for its patients. This is vital, since the tone or morale of a sanatorium depends on it; and here is one of the reasons why Swiss sanatoriums are inferior to English. The defect is not peculiar to any particular Swiss sanatorium; it is inherent in them all and comes from their being situated in the Alpine towns which cater for holiday-makers. The interest and "life" of these towns is almost entirely bound up with winter sports and the pleasures associated with hotel life. Now if a patient is to get any benefit out of treatment he must be debarred from these interests and pleasures, since they are not at all suited to the requirements of treatment. It is no use for a patient to think that he can lead a sort of modified holiday-maker's life. Very few patients are fit enough even to watch the skating, ice hockey, and the like. The intense cold on the ice rinks is highly dangerous to a debilitated person.

And if these interests are to be excluded, what is there left to do instead? Unfortunately very little. The Alpine resorts provide none of those varied interests associated with country life and scenery and outdoor nature study which help to make England eminently suitable to a patient undergoing treatment, and which often lead to new habits of life well calculated to maintain permanent arrest of the disease. It is really very striking how barren the Alpine resorts are in interests of this sort. English visitors as a rule do not realise it, because they are occupied with other things. At first the snow is interesting by reason of its novelty, but let the reader imagine a patient on his balcony looking over exactly the same bit of scenery day after day. There is no change, always the same featureless snow covering everything. It is not long before the monotony becomes intolerable and the patient finds himself longing for the sight of some green grass or brown earth or a shower of rain. The snow has the

property of making the landscape appear quite flat, like a bad painting on canvas, and the jagged mountain peaks crowding all round contribute very largely to this sense of flatness. The reason for this is, I think, that the mountain peaks do not constitute a true horizon; they seem much too close. It is the horizon which is largely responsible for that exhilarating sense of space and openness in a fine landscape, and when the horizon is absent, the effect produced is that of unhappy constriction. This point is important, since many people are accustomed to derive satisfaction and benefit from the contemplation of a noble landscape, and for these people prolonged residence in an Alpine valley becomes exceedingly depressing.

In case these views seem at variance with the well-attested excellence of Swiss scenery, it may be mentioned that none of these defects is noticed in the great open valleys of the lower parts of Switzerland where a distant range of mountains makes a truly noble prospect; and to the climber who scales the peaks bounding the valleys there comes, of course, a different feeling. But a patient cannot climb and must remain anchored in his narrow valley.

Exercise.

In Switzerland the prescribed daily exercise for patients is limited to walking and it is very soon borne in on one how unsuitable a mountainous country is for such purposes. The country ramble is impossible, for there is no country to ramble in. The daily walk must consist of the same dreary tramp along a very ordinary road with the perpetual snow all round. Little wonder if the therapeutic value of the walk is largely lost.

As an alternative the patient may make for the town and seek relief by looking at the shops. This may sometimes be interesting, but repetition soon leads to surfeit. The towns are in fact as unsuitable for patients as is the country. The real and only interests of the towns are for the holiday-makers. If a patient has been in the habit of deriving pleasure from the sight of beauty and harmony in architecture he will be as much at a loss in these towns as one who loves the open country. As everyone knows, the large Swiss towns in the lower levels are places of which the inhabitants are justly proud. But the Alpine resort is not of this order. It consists of a cosmopolitan jumble of disharmonious buildings dominated on the one hand by large and ostentatious hotels and on the other hand by somewhat sinister-looking sanatoriums with serried rows of balconies and beds. The effect produced by a prolonged stay in such a place is very dismal, and one is impelled to the conclusion that winter life in the high Alps is not at all suited to the needs of a sick person.

Spring and Summer.

If the winter is unsatisfactory, what about the spring and summer?

Well, the snow begins to melt. This is a tremendous fact. To one who has lived amongst continued frost and snow for three months this phenomenon is miraculous. The slush and mud that follows is usually apologised for by the Swiss; but it need not be, for to many patients the sight and sound and feel of water and mud coming at last after three months of deadly frost is a real delight. For a short time there is a great quickening of interest all around, and it is a thrill worth experiencing to witness the break up of the frost.

Unfortunately the promise of good times to come does not materialise. An altitude of 5000 feet is too high in this latitude for a good summer, especially when there are peaks all round of 8000 feet or more permanently covered with snow. The cold from these mountain peaks condenses the moisture out of every wind that blows, so that the valleys soon become choked with damp swirling mists. More snow and sleet comes down and melts again and so the summer drags on. In June the weather may resemble an English February, and it is not unknown for snow, sleet, or rain to fall every day for many weeks on end.

With such prevailing conditions I cannot see any reason whatever for recommending the high Alps as suitable places for the treatment of tuberculosis during spring or summer. The alleged advantages of the clear Alpine winter are unmistakably absent, while all the real disadvantages associated with altitude remain. Yet during this period the sanatoriums keep fairly full. Many of the patients are old-standing cases too ill to be moved, but a number of new ones continue to arrive. It seems a pity that these new cases should be handicapped from the start by the inclemencies of an Alpine summer, but there seems to be no way out of the difficulty so long as patients are sent to Switzerland, for anything is better than a policy of hasty change and change about in the treatment of tubercle.

The English Alternative.

I will conclude these notes with a short plea for England and English sanatoriums for the treatment of English patients.

How comes it that we are for ever running down our own climate until we delude ourselves into believing that the things we say about it are true? The foreign press does not fail to make capital out of this peculiar habit. With modern facilities of transport everyone who possesses money but who has lost health wants to be running off each winter to Switzerland or the Riviera or Algeria. At those places they may find distraction, but they will not find any mysterious element in the climate which will automatically cause them to regain health.

There is so much adverse criticism of our winter climate that people are getting quite scared of it and are coming to believe that it is unhealthy. This unfortunate tendency should be firmly corrected, and it should be more generally known that the results of treatment of phthisis in our home sanatoriums during the winter are, if anything, better than those obtained in the summer.

There seems to be a danger that we are getting so urbanised or rather suburbanised that we are losing touch with the country and the healthy rhythm of the changing seasons. For the city worker, the winter is apt to be thought of in terms of pelting rain on asphalt or stone pavements, whereas for the countryman, the winter has its own special interests and occupies a harmonious position in the cycle of the year.

But whatever mode of life a person has been used to, if he develops phthisis there must come a big change in his life at any rate during the months of active treatment, and it is of great importance that he should be started from the very beginning on the correct lines for re-establishing his health. Suppose he is sent to Switzerland and gets an "arrest" (the disease sometimes has a way of healing without any treatment at all), he will assume that the Swiss climate has done the trick and always in the future he will dread the winter at home, and will hanker to spend it abroad.

There are many unfortunate people like this who, if they have money, go out winter after winter wasting their time in an Alpine health resort, and what is worse they never seem to regain a sense of stable health. Such people can never hope to settle down to a steady job at home. But if, on the other hand, a patient has the good fortune to be sent to a good English sanatorium in the heart of the country he will receive a liberal education. He will be taught where the real dangers to health lie, and how to avoid them. He will be astonished to find how pleasant, varied, and health-giving our winter is, and quite often he will learn to appreciate the subtle changes that each month of the year brings to the countryside. Thus he may eventually return to his former employment with many added interests in life.

Of course, even under the best conditions so far devised, there are still many in whom the disease will progress to a fatal termination. It is a reproach to medical men that so many of these unfortunates should be allowed to die in a foreign land.

ASTHMA.

FOR the brief period 1928–29, cut short by the death of the benefactor who provided the funds for the Fellowship, Dr. Una Ledingham acted as Research Fellow for the Asthma Research Council. She spent some months of her Fellowship studying the methods of treatment used at various continental spas, and an account of her impressions forms part of the report of progress just issued by the Council.[1] She went to Mont Dore, Bad Reichenhall, Vienna, Hamburg, Berlin, and Bad Ems. At Mont Dore each patient is advised to undergo daily treatment for three weeks, and to take the cure during three concurrent seasons. Treatment in the main consists in drinking, inhaling, and bathing in the waters, with nasal douches of natural water or gas, gargles, and all forms of hydrotherapy as adjuvants. Of these processes she describes only the inhalation, gaseous, nasal douche, and the half-bath; the nasal and pharyngeal douches and general hydrotherapy differing from those in use elsewhere only in the utilisation of the natural water. She could get no definite indication relating to the factor in the cure regarded as most potent for different types of asthma. It appeared that a certain number of cases were relieved, that the inhalation had a beneficial effect in some cases of bronchial and dry asthma, and that the nasal gas was well appreciated by those patients with added nasal disturbance. Among points unfavourable to the particular type of inhalation in use Dr. Ledingham put the danger of chill from leaving a warm saturated atmosphere for a cold drier one, and the general exhaustion resulting from the great heat. At Bad Reichenhall compressed air treatment in special pneumatic chambers seemed to give considerable help to some asthmatics, though the cure here is not considered to be as specific for asthma as that at Mont Dore. At Vienna inquiry was made as to the reliability and permanence of the results obtained by Dr. Ludwig Hofbauer. The principle of his method lies in educating the patient to concentrate on breathing out, by teaching him to hum during expiration, and to remain, as far as possible quiescent during inspiration. All information received tended to endorse Dr. Hofbauer's own opinion that this simple method gives very good results in many cases.

The Lerchenfeld institute at Hamburg was visited. It is equipped with an inhalatorium, an ultra-violet light department, a diathermy department, an X ray department, and a bathing and hydrotherapeutic department. A large gymnasium is fitted with all forms of apparatus for correcting deformity, amongst which is an elaborate chair for controlling respiratory movements and for reducing overdistension of the chest. Dr. Ledingham ascertained that the greatest reliance is placed on the compressed air chamber, combined with saline inhalation—with nasal sprays and inhalations where there are nasal complications. Diathermy, heliotherapy, hydrotherapy, and exercises are used in specified cases. At Berlin a system of chest exercises suitable for asthmatics was studied. The exercises are mainly expiratory, beginning and ending in every case with a long expiration. They aim to teach control of both phases of respiration, particularly expiration, and also to reduce overdistension of the lung. The method is designed to prevent the occurrence of emphysema in asthmatic subjects and is said to reduce the frequency and severity of the attacks. The treatment produced a favourable impression on Dr. Ledingham, and such cases as were available for examination and inquiry gave strong evidence in favour of the exercises. Bad Ems is recommended chiefly for chronic conditions of the nose and throat and to a lesser extent for bronchitis, including those cases of asthma with associated bronchitis. The natural water is used for drinking, inhaling, gargling, spraying, and bathing and there is no particular technique associated with the cure.

Dr. Ledingham's critical observations (pp. 17 to 19) on those methods in vogue at the continental spas which she had had the opportunity of testing will be of interest to practitioners. The report also contains brief summaries of the work done in asthma research clinics in London, Glasgow, Leeds, Birmingham, and Edinburgh between October, 1927, and May, 1930.

[1] Obtainable gratis from the Secretary, Asthma Research Council, c/o King's College, Strand, London, W.C.2.

BRITISH SOCIAL HYGIENE COUNCIL.

ON July 15th this Council gave a dinner at the Café Royal to members of the Colonial Office Conference. Mr. L. S. Amery, M.P., proposing the toast of Health and Empire, said that when the Colonial Development Fund was instituted the intention was that a considerable part should be devoted to building up health services. The best way of using it for this purpose was under consideration by a special committee, and he believed that recommendations would shortly be published. Some three-quarters of the inhabitants of the Empire lived under more or less tropical conditions, and over large areas the health problem underlay all others. Most of their many diseases were preventable, and notable among these were the venereal diseases which the Council was combating. Sir Ronald Storrs, Governor of Cyprus, told of the activities which had been started in the island by the visit of members of the Council. A local council had been formed, with the Governor as president, and five clinics had been set up.

Mrs. Neville Rolfe, secretary-general of the Council, proposing the health of the Guests, urged that English women living in the tropics should become social workers to the best of their ability. Their influence could be enormous, and there was something to be said for arranging that all women proceeding to the tropics should go through a short course of suitable training. It was important not to destroy native habits and ideas without putting something in their place. Mr. Srinavasa Sastri and Lady Baddeley responded, and the latter described the increasing effect of hygienic teaching in Nigeria. Dr. Drummond Shiels, Under Secretary of State for the Colonies, proposed the health of the President, and spoke in warm terms of the work done by the Council and its executive officers. Sir Basil Blackett, in his reply, touched on the decreasing confidence of the British about their mission to the world. While deprecating conversion with the Bible in one hand and the sword in the other, he regretted the decline of the missionary spirit, and he felt that the message of hygiene was still useful and important for Eastern peoples.

THE FLUELESS BEDROOM.

BEFORE the Section of Hygiene in Industry of the Congress of the Royal Sanitary Institute, recently held at Margate, Sir Francis Goodenough, president of the Section, delivered a brief address which brought to the attention of his audience two points of public importance, each point having added force by introduction from the chairman of the Gas Light and Coke Company.

The first subject to which he paid special attention is an extremely familiar one to readers of THE LANCET—namely, the damage done to town-dwellers through the deprivation of sunshine by coal-smoke, resulting in the carrying on of work under grimy and depressing conditions, accompanied by the heavy burden of expense for cleaning. Although an energetic society exists for the purpose of arousing public opinion as to the relative merits of burning crude coal when gas, electricity, coke, or smokeless fuel can be obtained, the society has never been well supported by the public, its efforts being much cramped by a lack of pecuniary backing. Medical men will welcome, therefore, the words of Sir Francis because they will feel assured that propaganda of similar sort will reach a large public through the activities of his company.

The second point in Sir Francis Goodenough's

address will not be so familiar to our readers, but his words here indicated a distinct public danger and one which is reflected in courts where medical evidence is of first value. "In connexion with the problem of hygienic heating," he said, "I should like particularly to enlist the assistance of this Institute and the whole of its members on one specific point which is presenting a new danger to health. There is a growing tendency on the part of builders to erect houses with one or more rooms, intended to be used as bedrooms, entirely unprovided with any flue, not even one sufficient to carry off the products of combustion from a gas-fire. This is actually done in some cases by local authorities for the deliberate purpose of encouraging the use of electric heaters—which they suggest render flues unnecessary. In nine cases out of ten the cost of electric heating drives the tenant to buy an oil stove or a cheap flueless gas stove. Neither is satisfactory, often not even safe; while an electric heater if installed has no ventilating effect, and only creates 'fug' in a flueless room." Like Sir Francis, we hold strongly that no bedroom should be without a flue to provide it with some degree of ventilation. An air brick, as he pointed out, can easily be pasted over by an occupant who hates draught, and medical men will agree with him that the prevalence of the flueless bedroom should be resisted.

DILAUDID E.

Part III. of the Dangerous Drugs Act, 1920, has been extended to include di-hydro-morphinone, its salts and any preparation, admixture, extract, or other substance containing any proportion of it. These may not be imported into or exported from the United Kingdom and Northern Ireland without a licence; as regards internal control the Dangerous Drugs (Consolidation) Regulations, 1928, will apply to them. The trade name of di-hydro-morphinone is dilaudide; it is not manufactured in this country.

Vacancies

For further information refer to the advertisement columns.

Aberdeen County Council, P.H. Dept.—Asst. M.O.H. £600-£750.
Aberdeen Royal Infirmary.—McRobert Lecturer in Malignant Disease. £800.
Aberystwyth Infirmary and Cardiganshire General Hospital.—H.S. £200.
Altrincham General Hospital, Cheshire.—Sen. H.S., and Jun. H.S. At rate of £150 and £120 respectively.
Ancoats, Manchester, Crossley Hospital.—Half-time Res. M.O. At rate of £50.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Bath, Royal United Hospital.—H.P. and Asst. H.S. Each at rate of £120.
Birmingham City, Public Health Dept., Tuber. Section.—Asst. M.O. £350.
Birmingham, Dudley-road Hospital.—Jun. Asst. M.O.'s. All at rate of £200.
Birmingham, Midland Hospital, Easy Row.—H.S. £150.
Birmingham, Queen's Hospital.—H.S. to Ear, Nose, and Throat Dept., Ophth. H.S., and Res. Anæsthetist. Also H.P. to the Birmingham Nerve Hospital. Each at rate of £70.
Birmingham University.—Walter Myers Travelling Studentship. £300.
Blackburn Royal Infirmary.—Res. H.P. £175.
Bristol Royal Infirmary.—H.P.'s, H.S.'s, &c. Each at rate of £60. Also Cas. H.S. and Dental H.S. Each at rate of £80.
Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £75.
Cardiff, King Edward VII. Welsh National Memorial Association.—Three Half-time Asst. Tuber. Officers. Each £300.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Asst. Anæsthetist.
Chesterfield and North Derbyshire Royal Hospital.—H.S.'s. At rate of £100–£175.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Coventry and Warwickshire Hospital.—Res. Asst. H.S. £125.
Colchester, Essex County Hosp.—Asst. H.S. and Registrar. £120.
Croydon County Borough, Public Assistance Dept.—Res. Asst. M.O. for Mayday-road Hospital. £300.
Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.
Doncaster Royal Infirmary.—Three H.S.'s and one H.S. All at rate of £200.
East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. Also H.S. to Special Depts. and Cas. O. At rate of £150 and £120 respectively.
Evelina Hospital for Children, Southwark, S.E.—H.S. Also Cas. and Out-Patient O. Each at rate of £120.
Fulham Hospital, St. Dunstan's-road, Hammersmith, W.—Third Asst. M.O. £250.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. Also H.P. At rate of £175 and £135 respectively.
Grosvenor Hospital for Women, Vincent-square, S.W.—Res. M.O. At rate of £100.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Hull Royal Infirmary.—Asst. H.P. Also Cas. H.S. Each at rate of £130.
Ilford, King George Hospital.—Hon. Dermatologist. Also Res. M.O. £200.
Indian Medical Service.—Commissions.
Islington Dispensary, 303, Upper-street, N.—Asst. Res. M.O. £220.
Kingston-upon-Hull, City and County of.—Res. M.O. for City Hospital, Cottingham. £350.
Leamington Spa, Warneford General Hospital.—Res. H.P. £165.
Leeds City.—Asst. Clin. Tuber. O. £500.
Leeds Jewish Herzl-Moser Hospital.—Res. M.O. £100.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Leicestershire County Council.—Asst. M.O.H. £650.
Leicester Royal Infirmary.—Cas. H.S. At rate of £125.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool Heart Hospital.—H.P. £52.
Liverpool, Hospital for Consumption and Diseases of the Chest, Mount Pleasant.—Asst. M.O. and Pathologist. £150.
Liverpool, Royal Children's Hospital.—Res. M.O. At rate of £120. Also Two Res. H.P.'s, and Two H.S.'s. Each at rate of £100.
Liverpool University.—Samuel Turner Research Fellow. £600.
London School of Hygiene and Tropical Medicine.—Research Studentships in Entomology and Protozoology. Each £250.
Manchester, Ancoats Hospital.—H.P. At rate of £100.
Manchester, City of, Withington Hospital and Institution, Nell-lane, West Didsbury.—Four Asst. M.O.'s. All at the rate of £275.
Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Sen. H.S. £130. Also Hon. Asst. Surgeon for Children.
Manitoba University.—Professor and Asst. Professor of Anatomy. $5000 and $3500 respectively.
Margate and District New General Hospital.—Res. M.O. £125.
Middlesbrough, North Ormesby Hospital.—H.P. £120.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Asst. Cas. O. At rate of £100.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. £150.
National Hospital, Queen-square, W.C.—H.P. £150.
Newark General Hospital.—Res. H.S. At rate of £175.
Newport, Mon., Royal Gwent Hospital.—Hon. Radiologist.
Northwood, Middlesex, Mount Vernon Hospital.—Jun. Res. H.S. At rate of £250.
Norwich, Norfolk and Norwich Hospital.—H.S. £120.
Nottingham General Hospital.—H.S. At rate of £150.
Nottingham and Midland Eye Infirmary.—Res. H.S. £200.
Oldham Royal Infirmary.—Two H.S.'s to Special Departments. Each at rate of £175.
Portsmouth Royal Hospital.—Cas. O. At rate of £100.
Preston and County of Lancaster Royal Infirmary.—H.S. £150.
Princess Louise Kensington Hospital for Children, N. Kensington. H.S. At rate of £75.
Reading, Battle Hospital.—Asst. Res. M.O. £300.
Reading, Royal Berkshire Hospital.—Cas. O. and Res. Anæsthetist. Each at rate of £150.
Redhill, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Royal Chest Hospital, City-road, E.C.—H.P. At rate of £100.
Royal Society, Burlington House, W.—Lawrence Research Studentship. £300.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. for Out-patient Department. £150.
St. Pancras South Hospital, Pancras-road, N.W.—Second Asst. M.O. £350.
St. Peter's (Whitechapel) Hospital, 74, Vallance-road, E.—Second Asst. M.O. £450.
St. Thomas's Hospital, S.E.—Surgeon. Also Surgical Registrar.
Sheffield City of, Winter-street Hospital.—Asst. Tuber. O. £350.
Sheffield, City Hospitals.—Infections Diseases Res. M.O. £350.
Sheffield, Jessop Hospital for Women.—Registrar and Obstetrical Tutor. £500. Also Asst. H.S. At rate of £100.
Sheffield Royal Hospital.—H.S. to Ear, Nose and Throat Dept. Also Res. Anæsthetist. Each at rate of £80.
Sheffield Royal Infirmary.—Temp. Asst. for Path. and Bact. Dept At rate of £200. Also Two H.S.'s. and Ophth. H.S. Each at rate of £80.
Shrewsbury, Salop County Council.—Asst. M.O. £600.
Sidcup, Queen's Hospital.—First Asst. M.O. £400.
Southend-on-Sea County Borough.—Asst. M.O.H. £600.
Swanley (Kent) Hospital Convalescent Home, Parkwood.—Res. M.O. At rate of £200.
Swansea General and Eye Hospital.—Asst. Pathologist. £400–£500.
Swindon and North Wilts Victoria Hospital.—Res. M.O. £125
Truro, Royal Cornwall Infirmary.—H.S. £170.
Ventnor, Isle of Wight, Royal National Hospital for Consumption and Diseases of the Chest.—Asst. Res. M.O. At rate of £300.
Warrington Infirmary and Dispensary.—Res. H.P. ££75.
West African Medical Staff.—M.O.'s. Each £660.
West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—Jun. H.P. At rate of £100
Western Hospital, Seagrave-road, Fulham, S.W.—Sen. Asst. M.O. £650.
Willesden General Hospital, N.W.—Jun. H.S. £175. Res. H.S. and H.P. £110 and £100 respectively. Also Registrars.
Wolverhampton Royal Hospital.—Cas. O., and Res. Anæsthetist. At rate of £125.
Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.
York County Hospital.—Res. Anæsthetist and Asst. H.S. £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Tighnabruaich (Argyllshire).

ADDRESSES AND ORIGINAL ARTICLES

NEUROHYPOPHYSIAL MECHANISMS FROM A CLINICAL STANDPOINT.

BY HARVEY CUSHING, M.D., C.B., F.R.C.S. (HON.),
PROFESSOR OF SURGERY, HARVARD UNIVERSITY.

Localisation of Function in the Interbrain.

PART II.*

IT can be gathered from what has gone before that indications of posterior lobe participation in our several hypophysial tumour-syndromes are, to say the least, inconspicuous, and what slight evidence of such participation there may be has been lost sight of owing to the recent diversion of our attention to the adjacent walls of the third ventricle. To this region we may now return, for there are other symptoms than the polyuria and adiposity already briefly considered, such as sugar metabolism, the thermo-regulatory mechanism, and the phenomenon of sleep, with which in the past the pituitary body had supposedly had something to do, and which it may yet prove to have.

When one speaks of localisation of function in a given part of the brain, it means nothing more than that the nerve centres, which are the primary receiving or discharging stations for impulses from or to other structures, are more or less clustered, and it was with the localised accumulations of cells in the cerebral cortex that experimental neuro-physiologists largely concerned themselves from the time of Fritsch and Hitzig and of Ferrier, until with Sherrington's decerebration experiments the study of the deeper and older parts of the brain really began.

What happened, for example, when the precentral gyrus was stimulated, when the calcarine cortex was damaged, when the vestibular nuclei were injured, was easily observed and comparatively easy to understand, but when glycosuria was produced by a puncture of the fourth ventricle, rigidity by decerebration or, as now, polyuria or adiposity by an injury of the hypothalamic tracts or centres, something far more fundamental and complex has occurred. In all instances, however, it may be taken as a principle that some governing function of a given part of the brain on tissues or organs that lie outside of it has been affected, whether by irritation or paralysis.

Now in the case of the diencephalon, we are dealing with an ancient portion of the brain which remains essentially unaltered in all creatures that have a brain at all. More than that, it proves to have direct neural connexions with the first of the organs of internal secretion to become recognisably differentiated and on which, as we have seen, the very perpetuation of the species depends. That structures in such close anatomical juxtaposition should be functionally independent would seem most improbable, even though we disregard their remote ancestry and demonstrable relationship.

DIABETES INSIPIDUS.

Something has already been said of the presumed mechanism of the hypophysial polyurias in the brief discussion of the antidiuretic properties of posterior lobe extract. Now that the position of the major hypothalamic nuclei are coming to be better understood both in experimental animals and man through such orderly studies as those of Malone (1910–1914) and of Rioch (1930), we may expect that someone soon will definitely determine the locus of the nuclear degenerations in those simpler cases of diabetes insipidus that are unaccompanied by tumours and which are supposedly post-encephalitic in origin. Though studies have already been made in this direction[1] and evidence favours the nucleus supraopticus, we do not yet know with certainty which of the two more important hypothalamic cell masses, this or the nucleus paraventricularis, is involved in the disorder, nor do the reports of experimental polyuria produced by hypothalamic punctures in the dog give us satisfactory histological information on this score. Certainly in none of these experiments could either of the bilaterally placed nuclei have been completely destroyed, and the tuberal nuclei, so far as can be determined, do not represent the source of the main fibre tracts that pass down the stalk to the posterior lobe.

Reports have been made by Levy [2] (1924) of retrograde alterations in the cells of the tuberal nuclei, and by Kary [3] (1924) of changes in the nucleus supraopticus after experimental injury of the canine posterior lobe, but what will prove more illuminating than the identification of such nuclear changes doubtless lies ahead of us in the pursuit of the secondary tract degenerations. The studies by Dr. Maddock of the tissues from his dog with experimental diabetes insipidus, which show an absence of nerve-fibres distal to the point of application of the clip, are, so far as I know, the first in which these secondary degenerations have been investigated.

What is known as the chiasmal syndrome leads surgeons nowadays to the frequent exposure of this region; and as will be subsequently pointed out, neurosurgical evidence strongly favours the nucleus supraopticus as the controlling centre for water metabolism. All this is in correspondence with the view that an experimental injury of the diencephalic part of the mechanism in question gives the most pronounced and enduring reaction. But there is no gainsaying that posterior lobe extirpations in the absence of tuberal injury will also produce the same diuretic response albeit a less striking one; and this P. E. Smith tells me he has observed in his hypophysectomies on the rat. Unfortunately no operation is likely to be devised which will serve to remove the epithelial investment of posterior lobe and tuber and leave the nervous structures intact, but it would probably lead to an intractable polyuria with the same certainty as an injury of the hypothalamic nuclei. It has been shown in Trendelenburg's laboratory (1928) that after extirpation of the posterior lobe the pars tuberalis and tuber cinerum contain an abundance of the antidiuretic and oxytocic substances normally to be found there only in trifling amounts, and that only when the tuber is subsequently destroyed does a persistent polyuria occur.[4]

* Part I. appeared in our last week's issue.

[1] Cf. Eaves, E. C., and Croll, M. M.: The Pituitary and Hypothalamic Region in Chronic Epidemic Encephalitis, Brain, 1930, liii., 56. These authors state that severely damaging nuclear lesions are less likely to cause diabetes and obesity than those less severe.

[2] Levy, F. H.: Zentralbl. f. d. ges. Neurol. u. Psych., 1924, xxxvii., 398.

[3] Kary, C.: Virchows Arch. f. path. Anat., 1924, cclii., 734.

[4] It is regrettable that the symptomatic effects of the canine hypophysectomies by improved methods, as reported by Dandy and Reichert (Bull. Johns Hopkins Hosp., 1925, xxxvii., 1) were not given in greater detail, particularly since the "stump of the infundibulum and the region immediately contiguous" was cauterised in a considerable percentage of cases to ensure destruction of all epithelial elements. Of 13 adult animals so treated, seven showed post-operative glycosuria and only five polyuria, whereas adiposity is not mentioned.

So far, then, as diabetes insipidus is concerned, the evidence at hand seems reasonably convincing that the disorder can be produced by nuclear degeneration from disease, by surgical injuries of the supraoptic region in operations about the chiasm, by the interruption of the nerve tracts in course whether from tuberal tumours, or punctures, by the experimental placement of a compressing clip on the infundibulum, and probably also (could this be accomplished) by complete removal of the epithelial investment which apparently elaborates the posterior lobe secretion—all of which indicates a diencephalo-hypophysial mechanism which can be broken at any one of three principal points—nucleus, fibre tract, and pars intermedia et tuberalis. We nevertheless, in regard to this most carefully studied of all diencephalo-hypophysial reactions, are left in doubt as to whether the phenomenon is stimulatory or paralytic, and the key to the problem may possibly lie in the neglect of the physiologist's contention that posterior lobe extracts have diuretic as well as antidiuretic effects, the former conceivably being the property of the epithelial investment, pars tuberalis in particular.

THE QUESTION OF ADIPOSITY.

An exaggeration of the elemental sensation of thirst is doubtless antecedent to these pathological polyurias just considered, and the imperative and irresistible call to quench it most certainly lies in this primitive region of the brain common to all animals. A no less primitive and equally impelling sensation is that of hunger, of which less has been said and written in connexion with the neuropituitary mechanisms. Patients with hypopituitarism, though they often become adipose, are notably small eaters, while acromegalics, on the contrary, often have a ravenous appetite scarcely appeased by five generous meals a day. This also was observed by Putnam, Teel, and Benedict in their dogs with experimentally induced overgrowth. In both states the sensation probably has something to do with the level of metabolism which is consistently low in hypopituitary, high in hyperpituitary states, but whence it originates (unless in the interbrain) is less clear.

Polyuria and its antecedent polydipsia are striking symptoms, often so abrupt in onset they can hardly escape notice. The acquirement of obesity, on the other hand, is an insidious process less likely to be observed and of which hunger is not a measure in the sense that thirst is of diabetes insipidus. It consequently presents an even more difficult problem than does that relating to the water balance, though there is little question but that the two will be found to have a similar explanation.

In all that has been written about fat metabolism in relation to the hypophysis and hypothalamus, emphasis has been laid almost exclusively on adiposity and little said of emaciation. If the adiposity is a paralytic phenomenon, as some assume polyuria to be, should we not expect to see a significant loss of weight as an irritative phenomenon? The condition of adiposo-genital dystrophy has so long engaged the attention of clinicians, the fact that there are lean as well as fat types of dyspituitarism associated with hypophysial as well as with hypothalamic tumours has not received the attention it deserves.

The tendency to adiposity, which first came to be recognised (1909) in hypophysectomised dogs and which we attributed to their increased tolerance for carbohydrates, has since been ascribed, as already stated, to accidental lesions of the diencephalon produced in the course of these early and awkwardly made operations. That such injuries frequently occurred there can be no doubt, and now that Smith has shown what extreme degrees of obesity may be produced by tuberal injuries in the rat without the possibility of injury to the gland itself, the question would seem to be decided. However, in one of Dr. Maddock's tuberal clip-experiments on dogs, after only a transient polyuria, the animal in the course of the succeeding months has become extremely adipose. So it seems to me not inconceivable that interference with the function of pars nervosa et tuberalis by blockage with retention of secretion through cicatricial formation may have had some part in causing the adiposity observed in our early experimental animals.

There remains, therefore, something to be said for the participation of the hypophysis in the mechanism of fat metabolism, and Smith himself admits that extirpation of the rat's gland in the absence of tuberal injury leads in time to a certain degree of adiposity even though it is less striking and prompt in appearance than after tuberal injuries. He nevertheless observed in his early attempts to destroy the rat's hypophysis by the intrasellar injection of a solution of chromic acid that in addition to the usual sequels of experimental ablation of the gland a marked adiposity occurred (and one may assume polyuria also though no mention is made of this) which may conceivably be accounted for by the diffusion of the corrosive along the stalk with destruction of the pars tuberalis without actual damage to hypothalamus. And in this connexion may be recalled the early observations on hypophysectomised tadpoles, a large and persistent fat organ being one of the four striking changes characterising the "pituitaryless" state. In contrast to its disappearance in the normal tadpole, this fat organ persisted in the experimental animals even on starvation, but injections of posterior lobe extract would cause its early absorption. This suggests that a similar treatment might have counteracted the adiposity of Smith's chromic-acid rats.

Though precise figures are not available, it has always been my impression that laboratory animals lost weight when given protracted treatment with posterior lobe extract; the substance may, therefore, be anti-adiposal as well as antidiuretic. It was shown by Coope and Chamberlain (1925) that the injection of pituitrin leads to an accumulation of fat in the liver in the course of eight to nine hours, and subsequent writers have found that the injections cause a disappearance or diminution of blood-fat, together with a decrease in the total fat of the peripheral tissues. Further and highly illuminating studies in this direction have been carried out in Biedl's clinic by William Raab (1926–28) who has found that minute doses of posterior lobe extract (pituitrin) when injected into the cerebral ventricles have a much more marked response in causing disappearance of neutral fat from the blood than when large doses are administered subcutaneously. The fat, meanwhile, is accumulated in the liver where it apparently is transformed. Since this pituitrin-effect is abolished by mechanical destruction of the tuber cinereum, by transection of the cervical cord or by section of the splanchnics as well as by drugs which supposedly paralyse the centres for heat regulation (aspirin, phenacetin, &c.), it was assumed that the extract stimulates the nervous centres of the tuber whence impulses pass, presumably by the descending hypothalamic bundles, to the cord and abdominal sympathetics and thence to the liver. Since it would appear that the normal operation of this neuroglandular apparatus is essential for the storage of such fat as is not immediately utilised by

he body, it is assumed by Raab that any disturbance ith the mechanism from hypophysis to liver will ead to an accumulation of fat, in other words, to besity.

Although in the clinic more marked examples of diposity are seen in patients with craniopharyniomas, which may well enough have damaged the iberal centres, than in patients with strictly itrasellar lesions that have not extruded themselves irough the diaphragma, an appreciable adiposity evertheless occurs in these cases also. So it is that ost patients with chromophobe adenomas in whom here is no possibility of tuberal injury (they at least irely if ever show polyuria) are definitely adipose. review of the clinical histories of our cases with is point in view reveals that in about 60 per cent. the females a sudden increase of weight (occasionally xtreme but averaging about 20 pounds) had occurred irly in the course of the malady more or less coincident ith the amenorrhœa and long before the evidences chiasmal pressure served to call attention to the nderlying hypophysial tumour. That the adiposity as not secondary to the amenorrhœa is shown y the fact that in approximately the same proporon of males a corresponding unaccountable early crease in weight had been recorded. The condition wholly comparable to the effect of an uncomplicated ypophysectomy on the weight of adult animals id it may, in all probability, be ascribed to the bliterative effects of the adenoma on the posterior be.

CARBOHYDRATE METABOLISM.

That the pituitary body was in some way related carbohydrate metabolism was first suggested the frequent association of acromegaly with abetes mellitus; and when it subsequently came known that both experimental and clinical ates of hypopituitarism showed a surprisingly gh tolerance for sugars,[5] this was looked upon another argument in favour of these states being e converse of acromegaly. Since that time, th the discovery of insulin and the development ready methods of estimating blood-sugar, an tensive reinvestigation by many interested persons the entire subject of carbohydrate metabolism has en made, and the pancreatic islets might well enough looked upon as having the entire matter of sugar sposal under their independent secretory control.

Nevertheless from the time (1858) of Bernard's gar piqûre to the present day, we have been nfronted by the certainty that some neurogenic chanism lies behind the normal utilisation of this m of food. Efforts have been made more precisely locate the so-called sugar centre in the fourth ntricle, and Brugsch, Dresel, and Levy have recently 921) provided evidence that it lies in the dorsal gus nucleus whence parasympathetic fibres are pposed to pass to the pancreas and sympathetic res to the adrenal. However this may be, and ubt has already been cast on their interpretation, e fourth ventricle can be little more than a relay tion for impulses producing glycogenolysis that me from higher up. In a long drawn out experintal study of the presumed rôle of the posterior pophysis in carbohydrate metabolism with Weed d Jacobson as my co-workers[6] we came to believe 913) that glycogenolysis was produced by the eration of a pituitary hormone set free by impulses aching the gland through the cervical autonomic system. These observations have never been repeated and our findings may be capable of other interpretations now that attention has been drawn to the importance of the hypothalamic region whence possibly our glycogenolytic responses originated rather than in the hypophysis itself. One thing, however, we did learn was that the experimental animal must be given the opportunity to store what we called available glycogen if the glycosuric response were to be obtained. Possibly on some such basis may lie the explanation of the fact that transient postoperative glycosurias are rarely observed on patients in the clinic after operations involving hypophysis or third ventricle, for they are usually conducted after at least a twelve-hour fast.

That the glycosurias which occur in approximately one out of every four patients with acromegaly are not an effect of the pituitary tumour in itself, regardless of its type, is further shown by the extreme rarity of glycosuria with pituitary tumours of other sorts; and though the admission must be made that two patients with chromophobe adenomas (out of a series of 200 or more surgically verified lesions of this type) have had coincidental diabetes, glycosuria in the other cases has never been observed even as a transient episode immediately following operation.

The diabetes mellitus of acromegaly, moreover, proves to be notably resistant to treatment by insulin, and it has been repeatedly shown that posterior lobe extract (pituitrin) will diminish or wholly counteract the blood-sugar-reducing effect of this product.[7] Since it is well known that posterior lobe extract produces, at least in animals, a transitory hyperglycæmia and glycosuria, it is a natural assumption that in acromegaly the neural portion of the gland is activated, possibly in connexion with the known tendency of these cases to have a high basal metabolic rate. What is more, the occasional spontaneous recovery from the diabetes mellitus of acromegaly with the continued progress of the underlying disease may point toward the gradual elimination of posterior lobe activity by pressure destruction from the enlarging tumour; and the occasional disappearance of an existent glycosuria after radical extirpation of a chromophilic adenoma suggests the possible resumption of activity in a previously compressed lobe.

With all this, and much of it is purely speculative, there is no gainsaying that the relation of the region in question to sugar diabetes is less evident than to that of water diabetes and to fat metabolism. Though temporary glycosuria may be provoked by experimental hypophysectomies or by hypothalamic injuries on animals, the effect is never prolonged, nor in my experience do operations for lesions of the hypophysis or third ventricle in man lead even to transient glycosuria.

A THERMO-REGULATORY CENTRE.

The existence of such a centre has long been postulated and such facts as we have in hand tend to place it in close relation to the primitive mechanisms under discussion. Indeed, Raab[8] (1926) marshals evidence in favour of its being identical with the mechanism which regulates the normal absorption and oxidation of fat within the liver which he takes

Cf. Goetsch, Cushing, and Jacobson: Bull. Johns Hopkins sp., 1911, xxii., 165.

The Autonomic Control of the Pituitary Gland, Johns pkins Hosp. Bull., 1913, xxiv., 40.

[7] This insulin-inhibiting effect of posterior lobe extract has been shown by Burn (Quart. Jour. Pharmacol., 1929, i., 509) to lie in vasopressin and not in oxytocin. Houssay and Magenta find that hypophysectomised dogs go into convulsions after smaller doses of insulin than do normal animals.

[8] Raab, W.: Wämeregulation und Fettstoffwechsel., Zeit. f. d. ges. Exper. Med., 1926, liii., 317.

to be one of the essential factors in heat production. The necessity of a diet rich in fat to sustain warmth in arctic regions and the fat "gland" of hibernating animals on which the animal draws for sustenance during its winter period come immediately to mind.

An interference with thermo-regulatory control may lead to an abnormal fall or rise in body temperature. A well-known example of the former is the marked fall in body temperature after high transection of the spinal cord by wounds; another, the extreme elevation of temperature that occasionally follows intracranial operations. Both conditions are prone to be fatal and in both, in my experience, the victims are likely to feel comfortable and have no consciousness of the altered body temperature.

In the early experimental canine hypophysectomies, which often led to what was called cachexia hypophyseopriva, the gradual fall in temperature to the time of death in the course of five to ten days was often extreme, almost reaching that of the environment. Injections of fresh emulsified gland served as we thought to check the fall or even to re-elevate the temperature, but efforts to re-establish warmth by external applications of heat seemed merely to hasten death. It is a matter of general knowledge that patients with tumours that compress or destroy the posterior lobe, such as the common adenomas of chromophobe type, suffer from cold and have a consistently subnormal body temperature often averaging as low as 97° F. This might possibly have some connexion with their lowered metabolism; and the low body temperature and low metabolism of hibernating animals is proverbial.

Smith has called particular attention to the inability of his hypophysectomised rats to maintain a normal body temperature. One would naturally suppose that in these hypopituitary states a prompt rise in temperature would follow the injection of posterior lobe extract, but as a matter of fact it has, at least at the outset, just the opposite effect. Even if given intravenously, the extract causes, among other effects, a slight fall in temperature, but if injected into the ventricles the effect may be so pronounced as to be nothing short of startling. In one instance the rectal temperature fell to five degrees below normal and this was followed after three or four hours by a wave of pyrexia after which the patient experienced a marked sense of well-being. How to account for this unexpected antipyretic action of the drug is problematical.

Even more striking are the counterposed states of pyrexia. What is known as post-operative hyperthermia has long been a bête noir of neuro-surgeons. It is most likely to occur, particularly in children, after sudden, complete emptying of the ventricles and is one of the most dreaded consequences of radical extirpations of tumours which leave the floor of the dilated fourth ventricle widely exposed and which, at the same time, thoroughly empty the greatly distended and hydrocephalic cerebral ventricles. The body temperature may rise in the course of a few hours to 106° or even 108° F., the extremities meanwhile being so cold and clammy as to mislead the attendants and incline them to apply external heat.

Similar disturbances are known to follow operations for tumours of the third ventricle. I have recently removed a large suprasellar meningioma from a patient with a chiasmal syndrome, who, in the absence of any other post-operative symptoms referable to the third ventricle, for the subsequent ten days had a prolonged unremitting elevation of temperature, unassociated with leucocytosis or any evidence of infection. It was an unaccountable thermic wave almost like the temporary wave of polyuria th may follow one of these operations, slowly to retu to normal. Many other examples of this same ki might be given. The fact that these neurogen hyperthermias are notably influenced by antipyret drugs which are supposed to act directly on cerebr centres is also of significance.

On experimental grounds, a high and abru thermic reaction has been occasionally seen aft hypothalamic injuries of various kinds, and su studies as have been made in this direction by n associates have led some of them to believe that puncture in the region of the corpora mamillar is more likely than any other to produce the The whole subject, in short, is one which needs furth detailed study, and the recent perfection of apparatus which will permit of a continuous reco of body temperature will make further investigatio more precise than was formerly possible.

From what information we have, whether in cli or laboratory, it would appear that experimen or surgical lesions, whether in third or fourth ventric may lead to hyperthermia, and this suggests a pat way from the posterior diencephalon through t descending bundles to the cord, sympathetic nervo system, and viscera. In this connexion we m recall that Cannon's sympathectomised anim were no longer able to regulate their body temperatu but became hypothermic in a cold room and hyp thermic in heated ones, due presumably to the f that regulatory impulses from the hypothalam had been cut off.

PATHOLOGICAL SLEEP.

On what grounds the tortuous intracranial segme of the internal carotid arteries, whose branch enter the rete mirabile, came to be called "t sleepy arteries" is lost in antiquity, but for so reason or other the idea has prevailed that e function of sleep was ascribable to this regi There seemed to be something more in the idea th pure conjecture, but just what the mechanism f sleep and its alternate phase of waking might e was undetermined. Among theories innumerab that there may actually be a diencephalic cen for the process has been claimed, and the rec demonstration by Hess [9] (1929) of a definite hy thalamic area in the cat stimulation of which promptly induce a condition which is indistinguisha from sleep points suggestively in this direction.

Then, too, we have had before us, these past 15 ye the all too common examples of lethargy associat with encephalitis, a malady whose effects are pr to strike at this particular part of the brain as sho by other symptoms unmistakably hypothalamic origin. Accordingly, the not uncommon clinical sta of periodic somnolence called narcolepsy, which characterised, in the absence of any other sympto by periods of sudden irresistible drowsiness weakness, are commonly regarded as post-encep litic disturbances akin to parkinsonianism. And it is not without interest that patients, in whom th states of narcolepsy occur, oftentimes coincident become abnormally adipose. Pathological somnole is also prone to accompany such of the craniophar giomas as cause deformations of the third ventri but it is a still more common feature of what been called the hypersomnic form of brain tumour [10]

[9] Hess, W. R.: The Mechanism of Sleep, Amer. Jour. Phy 1929, xc., 386.

[10] A series of striking cases of this sort has been reported i the writer's clinic by J. F. Fulton and P. Bailey: Jour. N and Ment. Dis., 1929, lxix., 1, et seq., with complete bi graphy of the subject.

namely, the gliomatous lesions that arise from the walls of the third ventricle.

Thus it would appear that pathological sleep, and conversely of course abnormal wakefulness, in all probability are states induced by a disordered function of the hypothalamus, but we cannot at the same time lose sight of the fact that somnolence is also a characterising feature of many pituitary disorders in which the diencephalon can by no possibility have sustained direct damage. This is particularly true again of the chromophobe adenomas which are often associated with a notable drowsiness which 16 hours of sleep out of the 24 will sometimes scarcely satisfy; and the fact that polyuria is rarely seen in these cases would further emphasise the fact that the diencephalon has escaped injury.

There is another thing about sleep that deserved consideration—namely, its rhythmical periodicity. Cyclicism, which may be diurnal, lunar, or seasonal, is a peculiarity of many physiological processes. The unaccountable periodicity of œstrus and of menstruation, of rutting, and of hibernation are examples. That these cyclic occurrences are primitive and fundamental to the species there can be no question. The sloth awakens merely to take food and procreate. Hibernating or estivating creatures pass whole seasons unfavourable for sustenance with their metabolic processes so far slowed down they can survive meanwhile on their own tissues. That these processes are somehow under the control of this ancestral diencephalo-hypophysial apparatus seems most probable, for it at least accounts best for many of the physiological changes that are known to occur during sleep.

Some years ago (1915) the attempt was made in collaboration with Emil Goetsch[11] definitely to join hibernation on the pituitary body, but our opportunities for putting it to a conclusive test were inadequate. Unquestionably the secretory apparatus that controls tissue metabolism must be essentially inactive during hibernation just as it is relatively so in hypopituitary states, and since the hypophysis plays an even more definite governing rôle in these processes than we then ventured to believe, it would seem highly probable that winter sleep is made possible by the seasonal switching off of a diencephalo-pituitary mechanism which leads to sleep, oliguria, poikilothermia, slowed pulse and respiration, and the consumption of stored tissue fat at its lowest rate. And it may also be noted that on awakening from the hibernating state almost certainly from resumption of the activity of the anterior hypophysis and its influence on sex, the mating or rutting season usually sets in.

On the grounds of clinical experience, one must concede that after operations for hypophysial tumours, however radical they may be, post-operative hypersomnia is rarely seen. Only after operations in which the floor of the third ventricle has been subject to contusion, and only infrequently then, do we see evidence of pathological sleep of such prolonged nature as to excite comment. In a recent case after the removal of an unusually large olfactory groove meningioma which so far overlapped the chiasm and sella turcica as to cause marked deformity of the third ventricle, the patient during the course of the operation under local anæsthesia went into a profound, motionless sleep from which she did not gradually awake until nearly two weeks later. On the other hand, in the few cases in my experience in which tumours have been successfully removed from the cavity of the third ventricle, there has been no post-operative tendency either to abnormal drowsiness or wakefulness in spite of the inevitable contusion of the ventricular walls.

[11] Jour. Exper. Med., 1915, xxii., 25.

Diencephalo-sympathetic Mechanisms.

From what has preceded, the tendency to overload the third ventricle with functional responsibilities already begins to be apparent. What is more, there is an irresistible temptation anatomically to allocate these several functions in specific centres.[12] Whether this is wholly justifiable may be doubted, though we need not forget the rôle phrenology once played in adjusting us to the idea of localisation of function in the cerebral cortex. In addition to its highly important relation to the vegetative nervous system, the hypothalamus has come to be looked upon as a place where "emotional reactions are integrated." The uninhibited reactions of Goltz's famous partly decerebrated dog, which were known to all students of neurology 30 years ago, have been newly investigated by Cannon[13] and his pupils, who describe in decorticated animals an quasi-emotional (pseud-affective) state, designated "sham rage," the hypothalamic source of which Bard[14] subsequently succeeded in delimiting.[15] Since this state is accompanied by the same increase in blood-sugar, elevation of blood pressure, sweating, and outpouring of adrenalin, it is evident that the region lies in direct connexion with the spinal ganglia of the sympathetic nervous system. And recently Beattie and his co-workers[16] in their study of experimental cardiac arrythmias have furnished anatomical proof of this connexion by actually tracing the degenerations that follow experimental subthalamic injuries of the posterior part of the third ventricle. There is much more of this that might be told, but enough has been said to indicate what a promising field of experimentation has been opened up by these successive disclosures that serve closely to relate the diencephalon to metabolic processes, to the primary emotions, and, lastly, to the sympathetic nervous system.

With this mention of what may be regarded as a higher vasomotor centre in the posterior hypothalamus whence non-medullated fibres descend in the spinal cord to be distributed to the viscera, it would appear that we are now getting far removed from any possible participation of the hypophysis in this mechanism—yet we may not be so sure of this. It was shown by W. E. Dandy in my laboratory in Baltimore many years ago[17] that sympathetic fibres spreading from the carotid plexus could be stained by intravital methods and traced along the vessels of the stalk to the anterior hypophysis.[18] It was on this basis that the subsequent study, to which allusion has already been made, was undertaken with Weed and Jacobson, in the attempt to determine whether the autonomic fibres in question could be experimentally shown to have an effect on the pituitary body. We had observed that in dogs a puncture of the third ventricle

[12] Cf. Greving, R.: Die zentralen Anteile des vegitativen Nervensystems, Handbuch d. mik. Anat. d. Menschen, Bd. iv., Berlin, 1928, Fig. 120, p. 1043.

[13] Cf. Cannon, W. B.: Neural Organization for Emotional Expressions, Chap. 22, in "Feelings and Emotions," Clark University Publications, Worcester, Mass., 1928, p. 257.

[14] Amer. Jour. Physiol., 1928, lxxxiv., 490.

[15] Fulton and Ingraham (Proc. Physiol. Soc., April 27th, 1929, Jour. Physiol., 67) have produced a similar though chronic state of sympathetic hyperactivity by operative severance of the cerebral connexions of the hypothalamus.

[16] Proc. Roy. Soc. B., 1930, cvi., 253.

[17] Amer. Jour. Anat., 1913, xv., 333.

[18] Cowdry, E. V. (1930), has recently demonstrated in contact with the cells of this part of the gland the internal reticular apparatus of Golgi.

in the region of the hypophysis was almost as certain to produce glycosuria as a Bernard piqûre. Having then no reliable method of testing blood-sugar, we relied solely upon demonstrable glycosuria and soon found that in the same animal a succession of lesions (a fourth ventricle puncture, transection of the spinal cord at the fourth thoracic segment, stimulation of the superior cervical ganglion, and stimulation of the exposed hypophysis) could provoke an outpouring of sugar provided sufficient time was allowed between sessions for a reaccumulation of available glycogen.

These experiments doubtless are capable of reinterpretation in the light of new knowledge, but the point I wish here to emphasise in again mentioning them is that Bernard's piqûre may possibly cause glycosuria by injuring the descending hypothalamic bundles which lie superficially placed in the midline of the roof of the fourth ventricle. This, however, is not the only effect that lesions of this important tract may produce. Median cerebellar tumours that arise from the roof of the fourth ventricle are of common occurrence, and of late years, particularly since the advent of electro-surgical devices, they have come in large numbers to be radically attacked and removed. In this process the entire floor of the widely dilated ventricle is laid bare to view with the likelihood of its being subjected to trauma.

For reasons heretofore mentioned, a post-operative glycosuria is rarely observed after these surgical exposures of the fourth ventricle, though a post-operative hyperthermia, as already stated, is a not uncommon sequel. And while on this particular subject there is still another matter to which attention may properly be called. Three fatalities from acute perforations (one gastric and multiple, one duodenal and double, and a third œsophageal) have followed radical extirpations of cerebellar tumours, in two of them the fourth ventricle having been widely opened. The only possible explanation of these disconcerting accidents—and similar observations have been reported in medical literature—is that something injurious has happened to the nervous mechanism which in some way protects the gastric mucosa from auto-digestion. It is well known that most patients with peptic ulcer have an antecedent history of worry or apprehension associated with mental strain or fatigue, episodes of this kind being the usual preliminaries to recurrence of symptoms after their temporary recession; and I have been struck by the frequency with which patients with intracranial and particularly with third ventricle tumours have previously or subsequently had symptoms suggestive of gastric or duodenal ulcer.

All this concerning a diencephalo-sympathetic mechanism, which harks back to the early postulation by Kredel and Karplus of a cerebral representation for the sympathetic system, would appear to be remote from any conceivable bearing on the pituitary body. However, the fact emphasised by Raab, in his studies of fat metabolism that posterior lobe extract is particularly effective when injected into the ventricle, has led us to administer the extract in this way in a number of patients with pronounced hypopituitary states. They had all been previously operated upon for pituitary adenomas, and the injection was easily made through one of the burr openings for the craniotomy. We anticipated that there would be a rise in basal metabolic rate, in body temperature, and in blood pressure, possibly also a temporary hyperglycæmia; but quite the reverse happened.

The reaction has not been marked in all instances but when marked, almost immediately, and certainly before the extract could reach the blood stream, the patient flushes, breaks out into a drenching sweat, the blood pressure sinks, and the temperature falls. In one individual the rectal temperature dropped so low it could not be registered for several hours with a clinical thermometer, and two days later the observation was repeated with the record taken on a kymographic thermo-couple. The pre-injection rectal temperature of 98·8° dropped in the course of two hours to 93·8°, where it remained stationary for nearly two hours, and then slowly returned to normal.[*] The basal metabolic rate meanwhile fell from its pre-injection level of −27 to −50 when the temperature was at its lowest, and had only risen to −37 at the end of four hours.[19] When given subcutaneously in this patient the extract had no appreciable effect except as an antidiuretic. When given intravenously, as a control, it caused immediate pallor with no sweating and acted as a prompt purge; but the antipyretic response and effect on the metabolic rate was negligible. Corresponding reactions, though less marked, have been observed in other patients.

However these effects are to be interpreted, they at least indicate that we cannot safely ignore the possibility of some posterior lobe participation in the vasomotor and other activities of the interbrain. Whether there are other drugs that would act by way of the ventricle in this same vigorous way with the same promptitude is not known, but certainly the extract when so administered must act on the hypothalamic centres by direct absorption rather than by finding its way first into the blood stream, else, when injected intravenously, it would be expected to produce the same reactions with equal or greater promptitude.

But even should the "hypothalamists" grant that the posterior lobe way well enough be under the influence of the diencephalon now that the two have been shown to have histologically demonstrable neural connexions, they would still exempt the anterior hypophysis from any such control. As already pointed out, even the gonadal aspects of the adiposo-genital syndrome have been ascribed by them to hypothalamic injuries, and Smith, too, has included (1927) genital atrophy among the characterising features of the tuberal syndrome in the rat, leaving for the anterior hypophysis only the control of growth and the influence on thyroid and adrenal cortex. In all probability this gonadal effect is merely another instance of interference with hypophysial blood-supply, or of interrupted nerve-supply. Otherwise we could not possibly explain why precisely the same gonadal effects, produced by experimental ablations of the anterior lobe, can be effectively counteracted so long as replacement therapy is continued.[20] Moreover, the attribution to the tuber of an independent influence on the reproductive functions would appear to disregard the proven relation of the anterior lobe to these processes through a special hormone.

In short, it is highly improbable that these two corresponding effects should be produced, the one by an hypothalamic lesion, the other by removing the source of chemical messages, in the absence of any functional interaction. Though both are instances of deprivation effects, one paralytic, the other secretory, some light may be shed on the subject by recent observations, dealing with the activation rather than the inhibition of this particular neuro-

[*] A cubic centimetre of "surgical pituitrin" has been used in these tests.

[20] Smith, P. E.: Hypophysectomy and a Replacement Therapy. Amer. Jour. Anat., 1930, xlv., 205.

genital mechanism. To this purpose the rabbit lends itself particularly well, for, unlike rats and mice, it is a peculiarity of this animal normally to ovulate only after mating. The actual discharge of the ovum occurs after a lapse of 10 to 12 hours, this, as shown by Corner, being approximately the length of time it takes for ovulation to be artificially induced by the injection of the chemically isolated anterior-pituitary hormone of sex. To supplement this, Fee and Parks [21] have found that if the animal is decerebrated with inclusion of the hypophysis within an hour after mating the cycle will be interrupted, whereas if the decerebration is delayed for more than an hour, the normal process of ovulation will go on to completion. From this it is quite apparent that the copulatory act must set going some emotional and excitatory impulses which serve with promptitude to release the sex hormone from the anterior hypophysis. These impulses, arising in this way, could scarcely be discharged other than from that primitive structure, the interbrain, common to all mating species, and they either pass directly to the gland or, what is more likely, reach it in a more roundabout way through the sympathetic nervous system. Zondek speaks of the pituitary sex hormone as the motor that sets the reproductive cycle going, but the emotional self-starter is probably in the diencephalon.

Clinical Correlations.

We have so far, largely from an anatomical and physiological point of view, considered more or less separately the anterior pituitary, which is typically a gland of internal secretion, the infundibular lobe with its epithelial investment which has a secretory mechanism dissimilar from any other in the body, and finally the diencephalon, an all-important station for the transmission or possibly for the inauguration of vegetative and emotional mesages. And while discussing these separate parts stress has been laid, so far as possible, on their interdependence.

Though in modern times attention was redirected to this region of the wondeful rete by its tumours, our principal source of knowledge has been, as usual, the experimental laboratory where there are now so many interested workers, ably abetted be it said by the dog, the rat, the ox, and the pollywog, scarcely a day passes without some new disclosures. These may be in harmony or in discord with established views, and to correlate with clinical experience what knowledge the laboratory provides is often difficult, even baffling. This may be for want of that peculiar acumen or instinct that tells what at the bedside is worth recording, but it is partly due to the adaptability of the body to its pathological processes which may so effectually hide their symptomatic effects as to render them scarcely possible to detect. Endocrinology lends itself to two glaring faults, one the popularisation of writing on the subject, and the other a tendency of clinical observers to draw upon their fancy in a symptomatology which does not lend itself to precision.

The first thing with which one is forcibly struck in clinic and pathological laboratory is the frequency with which lesions that supposedly would throw the diencephalo-hypophysial mechanism wholly out of function may give, at least in the present state of our perception, no appreciable symptoms whatsoever. It is well known, for example, that in hydrocephalus the walls of the third ventricle become ballooned out to paper thinness and apart from the clinical tradition that hydrocephalic children are apt to be placed, good natured and well nourished, the 'tween brain appears to be doing its work well enough.

Even more striking is the fact that large tumours may come to fill the third ventricle, and so to distort its walls as to leave no recognisable trace of them, without the slightest symptomatic indication of any interference with the neurohypophysial mechanisms which have been so laboriously analysed. Should one wish to present further evidence that all of this talk about the hypothalamus and its functional importance is mere rubbish, the fact may be adduced that tumours of the third ventricle are far more often betrayed by ventriculography than by the neurological symptoms they provoke; and to make this still more emphatic, the further fact may be dragged in that under favourable circumstances tumours of this region may be successfully removed without provoking any of the symptoms heretofore discussed at such length. In two recent cases, by a transcortical approach through a hydrocephalic lateral ventricle a roentgenographically-demonstrated ependymoma filling the expanded third ventricle has, with much trepidation, I admit, been radically dissected out of its bed leaving a large, raw cavity with no subsequent trace of personality change, of polyuria, adiposity, somnolence, hyperthermia or vasomotor disturbance, one or all of which might well enough have been expected.

But negative observations such as these, however, disconcerting, need not be given undue weight. Positive findings when suitably marshalled are more important than any number of circumstantially negative ones; and when cases come to be analysed in sufficient numbers, there is found to be convincing testimony in abundance. There are two types of tumour of the region which from a symptomatic standpoint are particularly informative. They are the chiasmal gliomas and the congenital tumours of the hypophysial duct to which frequent allusion has already been made.

THE CHIASMAL GLIOMAS.

These tumours, though less common than the craniopharyngiomas, provide an important contrast not only in that they are invasive and destructive but because they primarily involve the region of the supraoptic nucleus, whereas the congenital tumours produce their effects by pressure distortion and are more likely to implicate the hypophysis and the tuberal region.

A report upon these chiasmal gliomas, largely from an ophthalmological standpoint, was made in 1923 in collaboration with Dr. Paul Martin, at which time we had little to say of their tendency to invade the ventricle. In this respect to be sure the tumours differ greatly, for some of them are relatively benign types of glioma which fail to provoke recognisable diencephalic symptoms, whereas others of a more malignant type soon involve the anterior wall of the ventricle, and may in time wholly obliterate its cavity.

When one comes to review the clinical histories of the 22 cases in which such a tumour has been histologically verified, it is not surprising that the older records are found wanting in respect to some of the points on which greater emphasis might be laid to-day, rapid loss of sight having been the urgent symptom to which chief attention was naturally paid. Nevertheless, polyuria was observed in nine instances (six of them being recorded as diabetes insipidus with a daily output of *circa* five litres), and in only four cases was it expressly stated that there was no

[21] Studies on Ovulation, Jour. Physiol., 1929, lxvii., 383.

polyuria. Adiposity was noted (or the photographs of the patients indicate its presence) in eight instances, and in three there was notable obesity. Though one of the obese patients showed excessive polyuria, most of those with pronounced diabetes were, on the contrary, thin and tall; one of them, a recently observed case, was a spare young man, aged 23, six feet three inches in height, with marked diabetes of over three years' duration. In another instance, a boy 13 years of age with marked diabetes, the emaciation had become extreme.

Undue sleepiness, occasionally described as somnolence, was mentioned in six instances. The systolic blood pressure was 110 or below in the majority of the cases, the basal metabolic rate was subnormal in the nine patients on whom it could be taken, and the five early postoperative fatalities were all attributable to, or at least associated with, extreme terminal hyperpyrexia.

Occasionally one of these gliomatous tumours may evoke a definite "march" of symptoms which suggests a progressive involvement of the diencephalic centres. Of this the following is an example:

A previously healthy pre-adolescent school girl resident in New York, an only child, 13 years of age, in October, 1929, acquired an oculomotor palsy on the right eye and soon after was found to be blind in that eye. She was taken to a hospital, where on X ray evidence the diagnosis of a suprasellar tumour was made. Questioning brought out the fact that antecedent symptoms of polydipsia and polyuria had long been present; that during the summer of 1929 she had suddenly grown quite stout (her exact weight had not been taken); and that she had been withdrawn from school that autumn because of abnormal sleepiness (12 to 16 hours a day). Vision shortly after became impaired in the other eye, and soon the child showed a marked change in personality. It was difficult to induce her to take nourishment, she became uncontrollable, and soon acquired an unaccountable fever ranging from 101° to 104° F. which persisted for ten weeks up to the time of her admission to the Brigham Hospital.

On admission (Jan. 25th, 1930) the child proved to be more like a wild animal than a human being. She would lie quiet and apparently somnolent unless approached or touched when, as Dr. Oldberg's record expresses it, "she would become suddenly galvanised into tremendous hyperactivity." She would utter a succession of piercing shrieks, would thrash violently about the bed, meanwhile clawing and scratching at her attendants. Most of the time she was wholly irrational and incontinent and only after prolonged coaxing could she be persuaded to take food or drink. She was found to have: (1) a primary optic atrophy with apparent blindness; (2) a normal sella turcica without suprasellar calcification; (3) a persistent pyrexia without accompanying leucocytosis; (4) a pulse-rate of *circa* 140 with arrhythmia; and (5) an oliguria rather than a polyuria, so far as could be determined. There certainly was no polydipsia.

The child remained in this hopeless state with conditions unaltered for the next three weeks. An exploration offered little but was finally undertaken on Feb. 18th, when a soft glioblastoma of malignant type involving the chiasm and spreading widely into the ventricle was disclosed. A considerable mass of this tumour was sucked out and radium seeds implanted. There was subsequent hyperthermia and she died 48 hours later with a rectal temperature of 108°.

Here, then, was a case in which disturbance of water and fat metabolism, of thermal regulation, of sleep, and possibly of the vasomotor mechanism were finally all obscured by the removal of cortical inhibitions which left the patient in a state quite comparable to the "sham rage" described by Cannon and others in decorticated animals. All these symptoms, it will be observed, may well enough be looked upon as purely diencephalic in origin, with no obvious bearing on the pituitary body whatsoever. As a matter of fact, since three out of every four of the recorded chiasmal gliomas occur in childhood, since many of them pursue a rapid course, and since the hypophysis does not become directly involved in the process, secondary disturbances of growth and maturation are inconspicuous or wholly absent from the clinical picture.

THE CRANIOPHARYNGIOMAS.

In contrast to the foregoing, the symptomatic sequence in the congenital hypophysial-duct tumours is more slowly progressive. The effect of the lesion upon the secretory activity of the anterior hypophysis is ordinarily evident from the outset, and owing to the usual point of origin of the lesions they come to exert their pressure effects against stalk, infundibulum, tuber, and chiasm from behind and below rather than from in front as do the invasive gliomas just considered.

A systematic review of 80 of these cases that have been histologically verified, however disheartening from a neurosurgical standpoint, for they represent one of the most baffling of neurosurgical problems, yet provides a fruitful source of study of diencephalo-hypophysial symptomatology. As already mentioned, these tumours vary greatly in position, size, distribution, histological character, age of symptomatic onset, and ultimate complications. They may be minute, pea-sized cysts, or huge, calcareous masses the size of a tennis ball; they may originate and remain confined within the sella or, what is more common, lie wholly above it and consequently they are, most of them, lesions that compress the tuber and hypophysial stalk early in their course.

Two of the constitutional features characterising the syndrome of Fröhlich—namely, the retardation of growth and adolescence—are sufficiently well explained in the young patients by the interference, through compression, with the normal secretory activities of the anterior hypophysis. An explanation of the adiposity is less clear, and the fact that it often occurs in the absence of polyuria shows that these two symptoms do not necessarily go hand in hand. Indeed, patients with a tumour confined within the sella, as is true of the adenomas, often show adiposity when the tuber could hardly have been affected.

The age-distribution of these cases at the time of their hospital admission has been by decades as follows: 15 in the first; 27 in the second; 15 in the third; 10 in the fourth; 7 in the fifth; 4 in the sixth; and 2 in the seventh decade. By far the more striking symptoms occur in the younger groups, in which evidence of anterior lobe impairment is shown by delayed growth or actual dwarfism and by retarded maturity or persistence of actual infantilism. Most of these younger patients at the same time show a tendency to be over well nourished, or they may be actually obese. This, however, is not invariable, for some of them are actually thin or emaciated; and others become definitely progeric in appearance, suggesting the gradually developing cachexia observed by Smith in his hypophysectomised rats.

Some of these purely anterior lobe symptoms may be carried over from early life to the third decade, but this is unusual, for the almost inevitable secondary complication of hydrocephalus ordinarily serves to end the story before this. When, on the other hand, symptomatic evidence of the lesion, usually signalised by a disturbance of sight, is postponed to the third decade or later, growth and development may have been normal in all respects. Amenorrhœa, or, in the male, sexual dystrophy, then usually puts in an appearance, but under certain circumstances depending on the site of the lesion even these indications of anterior lobe involvement may be wanting. Our most recent case provides, through a sorry experience, an example of this.

A woman 27 years of age (Surgical No. 35994), having previously enjoyed normal health, was married in January, 1925, and soon became pregnant. At the time of parturition expulsion was impossible, and after a prolonged labour recourse was had to a forceps delivery which the child did not survive. In spite of no nursing, she continued to lactate for twelve months. Three years later, at her second pregnancy, precisely the same sequence of events occurred. Following this, she became hypersomnolent and showed marked mental changes accompanied by periods of fright that were regarded for some months as a post-partum psychosis until the presence of a frontal tumour was finally suspected.

On admission to the hospital she was found to have a choked disc of six diopters associated with suprasellar calcification and secondary hydrocephalus, possibly accounting in part for her mental changes. Perimetry was precluded; also the metabolism estimation. Her temperature was subnormal, registering 96° F. on one occasion. The blood pressure was exceedingly low, 80 systolic over 40 diastolic. Her skin showed a blotchy pigmentation. There was no adiposity or polyuria.

At the operation a subchiasmal tumour was disclosed and in the hope of thereby relieving the hydrocephalus its calcified portion was dislodged and an overlying cyst emptied. From this operation she never regained consciousness and died 24 hours later, apparently from cardiac complications without hyperthermia. A comparatively small cystic tumour, chiefly involving the tubero-infundibular region with intact pituitary body and stalk, was found at autopsy.

Here, then, is an example of a craniopharyngioma situated in the tuberal region that had given no symptoms of any sort till the third decade and even then none that could be ascribed either to diencephalon or to hypophysis, unless possibly the repeated difficulties of parturition can be ascribed to imperfect uterine contractions from want of posterior lobe secretion. As an offset to this case, one in which pronounced diencephalo-hypophysial symptoms first put in their appearance even later in life may be cited:

The patient, 46 years of age, a classical scholar holding a professorial chair, had always enjoyed excellent health, had been married for fifteen years, and was the father of three children whose ages were 14, 11, and 8 years respectively. His height was 5 ft. 9 in.; his average weight had long been stationary at about 182 lb.

Some six months or so before his hospital admission (viz., Oct. 3rd, 1928) he began to experience a subjective blurring of vision. Soon after this, in uncertain sequence, he became impotent, extremely drowsy, acquired an abnormal thirst with evident polyuria, and definite personality changes were soon observed.

Examination.—The patient was quite indifferent to his breakdown, bored by the neurological tests and note-taking, and though polite and serene if aroused, if left alone tended to drop off to sleep. He was occasionally incontinent and was once found in bed between the sheets with his boots on, fully dressed. The fundi were regarded as normal in spite of the presence of a large central scotoma in the left eye and a lower temporal defect on the right. There was unquestionable diabetes insipidus, his polyuria averaging from four to five litres daily. He was, perhaps, over well nourished but not more so than might have been expected of a man of his age accustomed to a sedentary life. The basal metabolic rate was −32 per cent. The sella turcica was of normal size and contour. The examination otherwise was quite negative and ventriculograms were interpreted as showing normal conditions.

The patient remained under observation for a month with the nature of his lesion undiagnosed, and as he was evidently deteriorating a transfrontal exploration was finally made on the assumption that a suprasellar tumour of some sort must be present. A solid craniopharyngioma was disclosed (on Nov. 5th, 1928) largely underlying the chiasm, which was pushed upward. The better to expose the lesion, the chiasm was split anteroposteriorly whereby the anterior third ventricle and supraoptic nucleus could scarcely have escaped injury.

From this operation the patient made an excellent recovery with improved visual acuity in spite of the permanent bitemporal hemianopsia to which he was committed. Instead of there being an increase in the polyuria it definitely and progressively diminished, and at the time of the patient's discharge (Nov. 26th, 1928), three weeks later, the intake and output had dropped to about 1500 c.cm. daily. Meanwhile, instead of gaining weight he had lost, from 191 to 175 lb.

He subsequently attempted to resume his college duties but it was too much for him and he spent most of his time in sleep during the winter and spring, there being occasional periods of transient polydipsia but no gain in weight. During the summer he was much better, quite like himself for the first time since the onset of his malady, but by the end of September he had again become so somnolent he would sleep 20 hours out of the 24. A month later pressure symptoms set in, with headache, vomiting, rigidities, Cheyne-Stokes respiration, slowed pulse, and on Nov. 26th, 1929, came the end, scarcely more than 18 months from the first observed symptom.

The emotional negativism shown by this man is highly characteristic of these particular lesions and stands in marked contrast to the violent psychomotor agitation ("sham rage") in the patient with a glioma previously described. Between the negative and positive emotionalism shown by these extreme types there are countless gradations that have long excited the interest of neurologists and psychiatrists.

The tumour in this particular case, a non-calcified though largely solid type of craniopharyngioma, not only filled the entire interpeduncular space, but projected into without enlarging the sella turcica, the pituitary body having become greatly compressed. The notable symptoms were impotence together with diabetes insipidus and moderate adiposity, both of the latter subsiding as the malady progressed, an increasing somnolence being the major terminal symptom. Tumours fully as large as this, however, may cause scarcely any appreciable symptoms and would remain practically silent were it not for the customary disturbance of vision from involvement of the chiasm and the terminal manifestation of hydrocephalus.

It would be superfluous to cite further clinical examples of diencephalo-hypophysial symptomatology. These few may well suffice. Here in this well-concealed spot, almost to be covered by a thumb-nail, lies the very mainspring of primitive existence—vegetative, emotional, reproductive—on which, with more or less success, man, chiefly, has come to superimpose a cortex of inhibitions. The symptoms arising from disturbances of this ancestral apparatus are beginning to stand out in their true significance. That the older literature proves to be filled with reports of cases as telling as any of those that I have cited goes to show that we have advanced no whit in powers of observation, merely that modern science has permitted us to give to them revised interpretations.

Final Argument.

There is indeed nothing wholly new under the sun; what appears to be new is no more than something old in a novel aspect. In support of this, and before attempting to assemble the arguments favouring the interdependence of diencephalon and pituitary body, I may be permitted a quotation from the writings of one of your countrymen, a seventeenth century physician and anatomist:[22]

"Seeing therefore there is such an affinity as before mention'd, between the *Rete Mirabile* and *Glandula Pituitaria*, and taking it for granted, that the office of the *Glandula Pituitaria* is not what it hath generally hitherto been believ'd, to the end we may attain a more exact knowledge of what it really is; it seemeth not altogether immethodical to take that part into consideration in the next place, together with the *Infundibulum*, which last hath not only as near a relation to the Gland as the Gland hath to the *Rete*, but such a close communication with it, that *it seems in a manner almost impossible to treat of one independently of the other.*"

The italics are mine, but the conception that pituitary gland and adjacent third ventricle can scarcely be considered separately is far from being so; and it may not be "altogether immethodical" in

[22] Ridley, H.: Anatomy of the Brain, London, 1695.

closing this address to supplement the statement made by Humphrey Ridley over two centuries ago by newly acquired, though at times somewhat contradictory, testimony, derived at many hands from diverse sources—evolutional, morphological, biological, pathological, and clinical.

The pituitary body is a combined neuro-epithelial organ present in all craniates. Its purely epithelial lobe is the first of the endocrine organs to be differentiated in the embryo; its neural portion is an outgrowth of the oldest part of the brain to be laid down. If the rudimentary organ is removed from the amphibian embryo its further growth and metamorphosis are promptly checked; if reimplanted, these effects do not occur, but the rudiment will not long remain functionally active unless neural tissue is included in the transplant. The infundibular lobe is an expansion of that ancient portion of the cerebrum, the diencephalon, which retains its simple structure in all creatures that can boast of a brain at all. Herein lie ancestrally important mechanisms common to all species which have to do not only with their vegetative functions, but with their primitive instincts—in mating, in satisfying hunger and thirst, in restoration from fatigue by sleep, in regulation of body temperature, in self-protection by combat or escape. From the diencephalon non-medullated nerve-fibres pass direct by way of the infundibulum to be distributed in the posterior lobe and its epithelial envelope. Extracts of this lobe contain a peculiarly active substance or substances, the injection of which serves to counteract one, at least, and probably more than one of the symptomatic effects of irritative or paralytic injuries to the suprajacent interbrain. Non-medullated nerve-fibres also connect this ancient station by way of the spinal cord and the sympathetic nervous system not only with the thoracic and abdominal viscera but some of them even turn back to act upon the anterior hypophysia itself. Hence diencephalic messages may be relayed to this somewhat insulated part of the gland on whose hormones depend not only normal body growth and the normal function of certain subsidiary endocrine organs but, indeed, the very perpetuation of the species. For without the presumably emotional discharge from this source of the hormone of sex, the chain of events leading to the escape, fertilisation, and implantation of the ovum cannot take place.

Though information may be gained by the independent study of its separate parts, physiologically the diencephalo-hypophysial mechanism can only be properly interpreted when looked upon as a whole and even then only when its influence on the entire organism is taken into account. So, at the end, I may appropriately quote what Thomas Willis said of that "divine artifice," the *Rete mirabile* and its function: "There is nothing in the whole fabric of an animal body more worthy of admiration . . . . nothing can be conceived as more skilful, and nothing which argues more forcefully the providence of a divine Author."

Corrigendum.—On p. 125 of THE LANCET last week in the footnote (No. 13) the names of Prof. G. Popa and Dr. Una Fielding were mis-spelt.

THE HOSPITAL SHOPPING BUREAU.—This organisation, which was established by the British Charities Association to assist the smaller hospitals to buy on the best terms possible, is to be shut down. It was pointed out by the National Chamber of Trades that the scheme was prejudicial to local retail traders who are constant in their support of the hospitals.

THE USE OF AVERTIN IN CHILDBIRTH.

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THE use of anæsthetics and analgesics in labour has been for long a matter of much argument, beginning on the day when Sir James Simpson courageously and dramatically eased the pains of labour for a royal patient. No humane practitioner would take the negative side if the means were to his hand, but hitherto the adverse arguments have held the field, mainly because of the absence of such means. At the present time, when much attention is focused on the history and development of midwifery, it has been shown that we cannot congratulate ourselves on its progress when compared with the sister arts, Medicine and Surgery. The reasons are not far to seek. First comes the inertia and conservatism associated with a fatalistic agreement that "man is born to trouble as the sparks fly upward." In this case it is *woman*, and since, till comparatively recent years, women's knowledge of the sciences and arts associated with medicine have been negligible, womankind has had to suffer in travail unassisted, except by the encouragement of the tender-hearted but non-understanding medical man, and the knowledge that the pain will not last for ever. Secondly, there is the fact that midwifery is very poorly paid. The result is that the older and more experienced practitioner tends to avoid it as much as possible, leaving the bulk of it to his junior, with his way to make and his experience to gain. Apart from the pain, which has been well described as "devastating," in the majority of cases of childbirth the course is physiological, and the larger number of patients will not and frequently cannot pay a fee at all commensurate with the care and anxiety required to make sure of a successful termination to labour. But the third and most important reason is connected with just that humanity and pity which is common among the medical profession. The cries of the patient, the trepidation of the husband, and the urgency of the woman's mother combine to urge the doctor to *hurry*, with many and various regretful sequelæ. The first two reasons will remain, I fear, for some time, but the third may be removed.

Apart from the actual difficulties of labour, there are associated questions which may be influenced by the administration of something to ease the pains. I believe that the results of the normally "devastating" pain of a first labour are far reaching. They include the wish to avoid further pregnancies, thus destroying the perfection of marital relations. They encourage the resort to various noxious or mechanically harmful contraceptives; and they frequently lead to the use of abortifacients, with their far-reaching pathological effects. In the end they lead to an unstable and anxious mentality which is very common in the ranks of those wives who have ambition to make something out of life higher than merely existing from day to day. Such observations were very impressive during five and a half years while I was in charge of a large gynæcological and obstetric department in a poor-law hospital, to which many of such cases eventually came.

The Available Agents Reviewed.

I am convinced that any agent which would remove or mitigate such memories of the first labour would also remove or mitigate some of these distressing

results. No such agent is worth anything unless it can be used by the general practitioner. Midwifery is, and will be, in his hands for some time to come. In hospital practice, and in well-paid nursing home practice, various means are at the disposal of the specialist. Scopolamine and morphine, or intermittent gas and oxygen, can be used with quite good results. But the former entails many visits to the bedside, and the latter may mean a sederunt of 8 to 12 hours—both quite impracticable for the general practitioner. The use of rectal ether has been associated with so much well-grounded adverse criticism that I have never tried it. Of course chloroform has remained the standby, but here again the practitioner must be present the whole time, and take the chances of chloroform poisoning, or confine its exhibition to the last few pains, which is not by any means enough to attain the end in view.

The introduction of avertin seems to give hope that at last we have something that fulfils the requirements. These are: (1) Safety. (2) Ease of administration. (3) Effective mitigation of pain for a sufficient period. (4) Absence of after-results to either mother or child. (5) Absence of undue prolongation of labour. (6) Portability. Avertin was introduced on the Continent, and I know of no literature in this country dealing with its use in labour. Like all such novelties, it had to find its place as regards indications, dosage, &c. The German literature, however, was so convincing that I experimented, and although even now I have only used it in a few more than 50 cases, in these it has fulfilled the requirements outlined above in a marked degree. Most of the work, both abroad and by myself, has been in hospital practice, but enough has been done in private to establish the usefulness of the drug.

Indications.

Avertin may be used in every case where the antenatal examination has given expectation of normal parturition, except if the presenting part is on, and stretching, the perineum. In such cases whiffs of chloroform are indicated. In abnormal cases, such as malpresentations, the abnormality, of course, has to be rectified, but unless definite operative measures have to be instituted, requiring a deep anæsthesia with great relaxation, avertin is useful in allowing time for the natural forces to come into play, for example in slowly rotating posterior presentations or in the operation of version and bringing down a leg. A marked disproportion between the head and the pelvis is probably an indication for Cæsarean section, but if this is contra-indicated, here again avertin will allow time for the cervix to dilate fully, and for as much moulding to take place as possible, before attempts are made to deliver, whether after perforation or not.

It is in primiparæ that the greatest use of avertin is found. All multiparæ will agree that the first was infinitely worse than subsequent labours. I was at first frequently too late in administering the injection to multiparæ. Once full dilatation is reached in them, and the waters have broken, the head frequently comes on to the perineum at once, and makes the injection difficult or impossible. A rather different

TABLE OF TYPICAL CASES OF CHILDBIRTH WITH AVERTIN.

No.	Age.	Labour commenced.	Two-thirds dilatation. Avertin given.	Drowsy in minutes.	Pulse—		B.P.		Child born.	Parity.	Reaction of mother.	Condition of child.	Intervals of contractions in minutes.	Milk.
					Before.	After.	Before.	After.						
1	28	7·45 a.	10·15 p.	8	102	90	140/80	130/90	11·5 p.	4th.	Avertin given too late. Wakes for pains.	Normal. Strong cry.	10–4	Good.
2	16	—	4·45 p. 5·15 p.	15	80	92	140/110	120/90	6·7 p.	1st.	Restless. Wakes for pains.	No effect.	5	,,
3	28	2 a.	5·45 p.	7	96	86	130/100	130/90	8·50 p.	,,	Wakes for pains.	Strong cry at once.	5–6	,,
4	19	—	2·45 a.	10	88	90	130/75	100/75	4·0 a.	,,	Unconscious during pains. Restless, needs slight restraint.	Cried at once.	4	,,
5	19	—	8·10 a.	8	84	80	125/70	100/70	11·15 a.	,,	Rouses during pains. Restless.	Strong cry.	10–3	,,
6	22	2 p.	3·50 p. 4·30 p.	10	100	104	160/100	150/110	6·55 p.	,,	Felt last 3 or 4 pains only.	Cried at once.	4	,,
7	32	—	10·50 p.	10	90	92	130/90	85/50	1·0 a.	,,	Unconscious between pains. "Felt nothing." Forceps applied for delay on perineum.	Slight apnœa.	5	,,
8	31	1·30 a.	9·0 a. 10·15 a.	—	—	—	—	—	11·15 a.	2nd	Drowsy, but felt pains slightly.	Slight asphyxia.	6	Fair.
9	27	—	8·30 p.	5	—	—	—	—	9·50 p.	1st.	Drowsy, felt nothing.	Normal.	—	Good.
10	24	3 a.	9·15 a.	6	96	100	140/100	135/100	5·45 p.	3rd.	Drowsy and painless for 4 hours. Slight pain for 2 hours.	Strong cry at once.	3–8	,,

a. and p. = a.m. and p.m.

Notes of Cases.—CASE 6. Albuminuria with marked œdema. CASE 7. Very long first stage—over 24 hours. Patient had morphia twice. CASE 8. Version under general anæsthetic, with induction of labour, for breech presentation with contracted pelvis. Prolonged first and second stages. CASE 10. Albuminuria. Long second stage. Action of avertin lasted for six hours, but thereafter patient fully conscious of contractions and pain. Dose should have been repeated. Child showed no effects.

time of administration must, therefore, be chosen in treating primiparæ and multiparæ.

A Typical Case.

The course of a typical case of avertin anæsthesia in a normal primipara is as follows.

The patient commences labour and either goes into hospital or nursing home, or sends for the doctor and midwife. As soon as a show or one finger dilatation of the os, with good regular contractions, has established the diagnosis, a quarter grain of morphia is given. Less morphia should not be given, as in some cases it has only the effect of increasing the excitement and distress of the patient, and strengthening the contractions. In a few cases another sixth of morphia is required, especially in primiparæ over 30, but commonly the effect lasts until a quiet dilatation has taken place in 6 to 12 hours. Occasional examination per rectum will give an indication of progress, but these are mostly unnecessary. Membranes of a normal toughness with a well-fitting head will not rupture until the os is about two-thirds dilated and on this rupture the doctor should again be called. At this point also the patient begins second stage pains, bearing down and complaining of severe backache. This is the time to give the avertin, and not before. The patient should be allowed to realise the severe pain that accompanies the descent of the head, in order that she may more fully appreciate the benefit of the comparative ease thereafter. With multiparæ, the optimum time for giving the avertin is less exact. It is better to anticipate the rupture of the membranes. In many cases there will not be time to give the preliminary morphia, and it is less necessary here. Avertin should be given when the cervix is fully half dilated. if the contractions are strong and regular. If they are not it is as well to wait until they are—probably another hour or so. The patient is then left to herself, the doctor having satisfied himself during half an hour that the pulse-rate, the respiration-rate, and, if he likes, the blood pressure are in good order. The administration of avertin may be accompanied by a short period of excitement if, in multiparæ, a previous injection of morphia has not been given. But this does not last more than five to ten minutes, and is usually entirely absent after morphia. The patient is asleep within five minutes in the majority of cases, although she may be roused to speak.

It is generally recognised that morphia should not be administered within two hours of the birth of the child, and avertin should not be given until two hours have elapsed after the morphia. The action of morphia in childbirth is very variable, but the usual slow dilatation in primiparæ gives ample time for such intervals to be attained. The rare case of precipitate labour in a primipara is easily recognised by the early prolonged and powerful contractions, and by the fact that the cervix is much further dilated than usual when first the doctor sees the case. It would then be treated like a multipara and the morphia omitted.

It is obviously of benefit to carry out all subsequent procedures quietly and gently. In nervous and excitable people full sleep may not ensue for 10 to 20 minutes. In certain cases in hospital and most cases in private, I have returned shortly before the "crowning" of the head, to give either a few drops of ether, or gas and oxygen, in order that the patient may have no recollection whatever of the birth of her child. In primiparæ this is useful, but in multiparæ quite unnecessary. If it is omitted, however, and the effect of the avertin is diminishing, the patient may become very restless and even uncontrolled during the passage of the head over the perineum. This has in a few cases made it difficult to "support the perineum" (a process which I consider really useless).

Technique.

The technique is simple. The apparatus required consists of: (1) a graduated glass cylinder to hold about 300 c.cm., with cork for same; (2) a small measure, say 10 c.cm.; (3) a funnel with tubing about three feet, ending in a glass connexion to join with (4) a No. 6 catheter; (5) a thermometer, F.; (6) a small bottle of 1–1000 Congo red solution; (7) a bottle of distilled water, say 1000 c.cm.; (8) avertin fluid.

The preparation of the injection is as follows:—

Into graduated measure (1) put about 160 c.cm. distilled water. By immersing this in a jug or other vessel of hot water, raise the temperature to 100° F. Measure 0·075 c.cm. of avertin fluid per kg. of body-weight. (This has frequently to be guessed, but it is not essential to be exact.) For example, 9 st. equal 126 lb., equal roughly to 60 kg. Sixty times 0·075 c.cm. equal 4·5 c.cm. Add this to the distilled water, insert cork and shake vigorously. (It is important first to raise the temperature to 100° F., or solution is delayed.) Take a few c.cm., say 5, of solution back into the small measure and add a couple of drops of Congo red solution. The colour *must not* change. I have never found a blue discoloration, showing presence of free dibromacetaldehyde. The temperature should again be raised to 100° F., and the solution is ready for use. Just after a good long strong contraction has passed, a catheter should be inserted high into the rectum and about 50 c.cm. run in fairly quickly. When the next contraction comes it is usually a small one, but strong pressure must be made round the anus, and the patient told *not* to bear down, or much of the fluid may be lost. There is seldom any difficulty in retaining the bulk of it.

After the first contraction is over, the rest of the avertin solution should be passed in, the process extending over about 15 minutes, and firm pressure being applied to the anus during a pain. By this time, however, the patient is probably asleep and does not bear down strongly. The fluid soon makes its way up past the point where the child's head is pressing on the rectum, and after about half an hour from the commencement of the injection there is no tendency for any to return.

The Advantages of Avertin.

It is necessary to examine how far this procedure fulfils the required conditions.

1. *Safety.*—The dosage I have used, 0·075 c.cm. per kg. body-weight, is well within the safety limits, according to my own experience and the literature. For general surgical practice 0·1 and even 0·125 c.cm. have been used, with good results reported. But such doses are unnecessary in labour and should not be used. I have never had a moment's anxiety about the condition of the patient. The table of typical cases shows a small increase in the pulse-rate. The blood pressure drops very shortly after the administration, but only slightly in most cases. Prof. W. Benthin, of Königsberg, reports a drop of 10–20 mm. Hg in 25 per cent. of cases, 30–40 in 25 per cent., slightly more in several, and in 19 cases the fall was 60 to 100. My cases have never gone so low as the latter, and even in his, with larger doses, the fall has been of short duration. It quickly returns to a few mm. Hg below normal. The patient, however, is in a very deep sleep, similar to alcoholic coma, and must not be left alone. Any good midwife may be left in charge to see that no respiratory interference is brought about by the patient's movements such as bending the neck or burying the face in the pillow.

As regards the child, in two cases I had to use forceps, since the head had lain long on the perineum, and the beat of the fœtal heart was lost. But this may happen in a non-anæsthetic labour, and in both cases I was over anxious—one was that of a doctor's wife. Here the delay was rather due to the excessive use of morphia and gas and oxygen. In one other case my assistant had a similar experience. In all three cases the child cried lustily immediately, and after birth showed no effects whatever.

2. *Ease of Administration.*—This has been fully explained in describing the technique. There are no "snags," except the partial return of the injection if run in too rapidly, and if the anus is not controlled.

3. *Effective Mitigation of Pain for a Sufficient Period.*—Avertin, in the obstetric dosage, is not an

analgesic or full anæsthetic. The patient, under the doses I have used, is conscious of the stronger contractions and of *some* pain, and frequently bears down strongly. Between pains, however, she is fast asleep, and thus avoids what I think is the main cause of distress and shock—namely, the constant intercontraction sacral pain. Apprehension is also removed, giving mental rest. The duration of action of avertin varies, like everything else in labour. Prof. Benthin gives 1 to 1½ hours for narcosis deep enough for major gynæcological operations. Prof. E. Martin, of Elberfeld, with a dose of 0·6 c.cm. per kg. body-weight, gives 1¾ hours in cases of childbirth; but I have found the effective duration much longer. The dose may be repeated, however, with safety, and Mr. C. C. Coghlan, of Sydney, has reported eight cases where three doses were given with no bad after-effects. But for the busy general practitioner I think one administration may suffice, and at least give a sufficient duration of action to prove a very valuable aid. I have never yet repeated the dose, contenting myself with giving whiffs of chloroform or ether for the final pains, if necessary.

4. *Absence of After-results to Mother and Child.*—The condition of the child is generally better than after an ordinary unassisted labour. In two cases the child has been somewhat sleepy, but in all the others it cried at once and behaved thereafter normally. One stillbirth was due to excessive moulding of the head with intracranial hæmorrhage. There is no such anxiety as is usually present after scopolamine and morphine. This factor alone made me unwilling to continue to use that method. Mr. Coghlan reports one case out of eight where the child was born "slightly blue and sleepy" after avertin. As to the mother, one case, that of the doctor's wife above mentioned, had paresis of the bladder leading to temporary retention. As this is by no means unknown in normal cases, I scarcely like to blame avertin for it. In all other respects the condition of the mother has been excellent. She is not exhausted. She sleeps naturally for some hours after parturition, and awakes apparently in normal healthy condition. No delay in the milk flow was noticed. Involution of the uterus was not affected. Since in most cases the use of avertin has avoided forceps the vaginal and vulval condition is improved.

5. *Absence of Undue Prolongation of Labour.*—It is here that antagonists to any form of anæsthesia make their most important point. The ground for such objection appears to me somewhat unstable. The duration of normal labour varies within such wide limits, owing to such varying factors, that any small prolongation is of little importance. Much is made of the want of "bearing down" by the mother. But the most perfect parturition I have ever seen was in a patient who had transverse myelitis, where no bearing down and no pain were present. The uterus is normally quite able to expel its contents unassisted by other means, and the absence of bearing down is an asset rather than detrimental.

The figures for prolongation of labour due to avertin, however, are not serious. Prof. Martin gives an average for the second stage (I do not completely understand where he places his initial point) as 3·7 hours for unassisted labour, and 4·6 hours with avertin. Mr. Coghlan's average for total duration of labour is 14 hours, and he uses more avertin than I have recommended. My figures show that labour is prolonged, but in no degree to affect the child, and so long as the mother is quiet and easy, only the doctor's time has to be considered. If the above technique and arrangement of dosage are carried out, this loss of time may not be serious. The third stage of labour is not delayed, except in such cases as delay may be expected for other reasons.

6. *Portability.*—The apparatus goes easily into a small hand-bag, and a fairly large size midwifery bag will accommodate everything without difficulty.

Conclusion.

In conclusion, it might be stressed that the use of avertin in childbirth, in my hands, has not given a painless labour. Nothing short of full anæsthesia will do so. But with avertin it is possible to make things so easy for the patient that she has no devastating pain, no prolonged backache, no exhaustion, and no memory of a terrible experience to jaundice her outlook on life. Prof. Martin recommends the solution of avertin in milk instead of distilled water, and says that the duration of action is thereby considerably prolonged. I have not used this to any extent, and have found the simpler method satisfactory enough. It has been noticed that the uterus is rather less firmly contracted at the end of the third stage than is usual in primiparæ, and that the loss may be rather more free. This has never given rise to any anxiety, and but seldom calls for an injection of pituitary extract, which, of course, is not given as a routine in primiparæ. In all the cases at which I have been present I have left the patient with perfect confidence, in the charge of an ordinarily trained midwife, immediately after the end of the third stage. There is no such laxity of the musculature as is seen after chloroform administration, and any slight laxity which may be due to the drug is probably compensated for by the absence of exhaustion and shock.

My experience leads me to think that this method of easing the pains of labour is worthy of trial by the general practitioner. It is not fool-proof but a very little practice is all that is necessary, and even a faulty administration, where much of the solution has been returned, has proved of benefit.

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COMPARATIVE RESEARCHES ON THE GALACTOSE AND LÆVULOSE TEST FOR HEPATIC EFFICIENCY.

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AND

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THE administration of galactose and lævulose for estimating hepatic efficiency has been largely used by different clinics. Bauer and Strauss's method of detecting galactosuria and lævulosuria involves a renal factor, and many workers, therefore, prefer to examine the blood-sugar curve. Some, however, (Bauer, Kahler and Machold, Noah, Davies,[1] Meller and Frisch,[2] and others) prefer the galactose tolerance-test, and others (Strauss, Schirokauer, MacLean and Wesselow, Spence and Brett, Hetenyi, Tallermann and Kennet, Finkelstein and Dannenberg, King[3] and others) use the lævulose tolerance-test. The clinical value of galactose and lævulose has been discussed

by Lepehne,[4] but no comparative researches have been published.

We have made comparative researches on these two tests to find whether they have a comparable clinical importance, or whether one of them is better, and which is the more reliable tolerance-test of hepatic efficiency.

Technique of the test.—In every case, after a thorough clinical investigation, we examined the fasting blood-sugar and then gave the patient 40 g. of galactose in tea. Then, at half-hourly intervals for two hours, we tested the blood-sugar by the micro-method of Hagedorn-Jensen. At the same time during a period of six to eight hours we collected the urine and determined the percentage of sugar in it by polarimetry. Two days later we repeated this test with 45 g. of lævulose. Then we performed the test with tetrachlorphenolphthalein according to the method of Rosenthal and Kunfi, by injecting 5 mg. per kg. of body-weight. Later we tested the blood to find the dye retention in the serum. Moreover, we determined the bilirubin in the blood-serum quantitatively according to Hijmans van den Bergh, and examined the urine qualitatively for the urobilinogen reaction.

Like Kahler and Machold, we considered the galactose test positive if the blood-sugar had risen over 30 mg. per cent. We find the examination of the galactose in the urine insufficient, as we have noted before,[5] since we have found seven cases in which the rise of blood-sugar far exceeded 30 mg. per cent., yet there was little or no sugar in the urine.

Opinions differ more about the lævulose test. According to some workers the rise of sugar in normal cases does not exceed 10 mg. per cent., after giving 40–50 g. of lævulose (Schirokauer, Isaak, MacLean and Wesselow, Spence and Brett); on the other hand, other writers (Tallermann and Kennet, Greene, Snell and Walters,[6] Brown,[7] and others) say that it may rise much higher, and they consider the lævulose test to be positive only after a rise of blood-sugar to over 30 mg. per cent. We have stated that in normal cases the highest rise of blood-sugar is 20 mg. per cent., and that is why we consider the lævulose test as positive when this figure is exceeded. We need not add that the examination of lævulosuria after 45 g. of lævulose has been given is completely deceptive. The variation in the rise of blood-sugar after the lævulose is to be explained as due either to impurities in the lævulose or to unsuitable methods of storing it,* or to variations in its absorption from the mucous surfaces.

A NEW INVESTIGATION.

We have investigated 41 cases of hepatic inefficiency. The value of the galactose and lævulose tests appeared in this series to be identical. In 14 cases, however—that is in one-third—the results were different. The height and duration of the rise in blood-sugar after the administration of galactose was not parallel with the curve of lævulose; the blood-sugar curve was flatter after the lævulose than after the galactose in five cases, while in three the lævulose test was slightly positive, and in four it was completely negative. Only in one case was the lævulose test positive (+39 mg. per cent.), with a negative galactose test (+28 mg. per cent.).

Consequently, we consider that the galactose test is better than the lævulose test. The metabolism of galactose, unlike the metabolism of lævulose, is performed primarily with the coöperation of the liver and not with other tissues (Fischler [8]). We do not wish to assert that the galactose test is always sure, but so far as we know galactose metabolism depends not only from the condition of the liver but also on the capacity of assimilation of other tissues (Achard and Desbouis[9]).

* We administered the lævulose of Schering, which was preserved in a dark jar hermetically sealed.

SUMMARY AND CONCLUSIONS.

The galactose and lævulose tests do not agree in one-third of all cases of hepatic disorders. In some cases the lævulose test in the presence of a positive galactose test is slightly positive or completely negative. The galactose test is very much more valuable than the lævulose test in the diagnosis of hepatic disorder.

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PUERPERAL INFECTION:

A BACTERIOLOGICAL STUDY.

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IT is generally believed that the *Streptococcus pyogenes* is the most common infecting agent in severe puerperal infection. In less severe infections, however—e.g., mild localised uterine infections—it does not commonly appear to be the causal organism.

Colebrook and Hare [1] reported that out of 1626 women delivered at Queen Charlotte's Hospital, there were 134 "morbid" and "clinically septic" cases. Of these, only ten (8 per cent.) yielded a culture of *S. pyogenes* from the uterus. In the remainder the predominant organisms recovered from cultures were diphtheroid bacilli, *B. coli*, non-hæmolytic streptococci, and various unclassified Gram-negative organisms. White [2] in Melbourne, out of a series of 25 cases of so-called "sapræmia" bacteriologically examined, reported only one infection due to *S. pyogenes*. Armstrong and Burt-White [3] stated that out of 34 cases of puerperal pyrexia of genital origin this organism was found in only eight instances.

METHOD OF INVESTIGATION.

Eighty-nine cases notified as puerperal infection have been investigated. Every case on admission to the Edinburgh City Hospital had a blood culture and uterine culture taken. Only aerobic cultures were made. Anaerobic organisms are said to play only a very minor part in the production of the disease, and Kinloch, Smith, and Stephen,[4] in their investigations on maternal mortality in Aberdeen, made only aerobic cultures. The uterine culture was made at the bedside. A blood-agar plate was inoculated in the usual way and immediately taken to the laboratory and incubated for 20 hours at 37° C. The plate was then examined for hæmolysis and suitable colonies were selected for further examination. Hæmolytic streptococci were easily identified. The colonies were small, round and dew-drop in size, being more opaque at the centre than the periphery. Hæmolysis was noted by a small circular clear area surrounding each colony. In 27 of the cases investi-

gated further steps were taken, and all types of streptococci were classified according to Holman.[5] Suitable colonies of streptococci were picked off the blood-agar plates, and cultures of peptone water agar containing the sugars lactose, mannite, and salicin were inoculated. This medium was prepared as follows :—

Ordinary peptone water was solidified with 2 per cent. agar, just enough litmus being added to colour the medium a light blue. The sugars (lactose, mannite, and salicin—all 10 per cent. sterile) were then added while the agar was warm. 0·5 c.cm. of 10 per cent. sugar was added to 5 c.cm. of medium and the culture sloped in the usual manner. After solidification had taken place a few drops of sterile human serum were run over the surface of the medium by means of a large platinum loop. After inoculation these cultures were incubated for 48 hours and then examined for fermentation. If fermentation occurred it was invariably always noted first near the bottom of the tube.

CLASSIFICATION OF CASES.

There were 61 cases of localised uterine infection, 9 cases of pelvic inflammation, 3 cases of general peritonitis, 14 cases of septicæmia, 1 case of paratyphoid B complicating the puerperal state, and 1 case of puerperal insanity.

Types of Organisms Cultured from the Uterus in 89 Cases of Notified Puerperal Infection.

Organisms.	Cases.
Hæmolytic streptococci (pure)	24
,, ,, and other organisms	12
Non-hæmolytic streptococci (pure)	19
,, ,, and other organisms	6
B. coli (pure)	2
,, and other organisms	7
Gonococci and other organisms	2
Staphylococcus aureus (pure)	1
,, *albus* (pure)	1
Enterococcus (pure)	1
Unidentified Gram-positive bacilli (pure)	2
Unclassified ,, ,, cocci (pure)	1
Other organisms (mixed)	4
Sterile	5
Contaminated	2

In two cases the uterine culture was accidentally contaminated. Five cultures were sterile. These were taken from cases as follows :—

The first was a case of serum disease. The patient had received antistreptococcal serum 14 days before.

The second was sent into hospital as a "contact" case and suffered from *B. coli* bacilluria.

The third case was not a case of puerperal infection and had no symptoms or fever while in hospital.

The fourth was admitted to hospital on thirtieth day of puerperium suffering from general peritonitis.

The fifth case was one of paratyphoid B complicating the puerperium.

Accordingly the following figures are based on a total of 82 uterine cultures, from which hæmolytic streptococci were obtained in 36 cases (44 per cent.) either in pure culture or in association with other organisms. Hæmolytic streptococci were present in pure culture in 24 cases (29 per cent.). Eleven of these cases were severe septicæmias, all giving a pure growth of hæmolytic streptococci on uterine culture.

In 27 Cases in which the Streptococci were Classified, the types were as follows.

	Uterine culture.	Cases.
Hæmolytic	*S. pyogenes* (pure)	11
	S. anginosus (pure)	1
	S. pyogenes with *Staph. albus*	1
	S. pyogenes with enterococci	1
	S. hæmolyticus III. with enterococci	1
Non-hæmolytic	*S. fæcalis* (pure)	7
	S. salivarius (pure)	2
	S. ignavus (pure)	1
	S. salivarius with diphtheroids	1
	S. non-hæmolyticus I. with *B. coli*	1

Of the 11 cases giving a pure growth of *S. pyogenes*, eight were cases of puerperal septicæmia.

Out of the 89 cases, 11 died. One patient with general peritonitis died. Her blood culture was negative, and the uterine culture gave non-hæmolytic streptococci. The other 10 deaths occurred in septicæmia cases.

EXAMINATION OF CULTURES.

The following results were obtained on examination of the blood cultures and uterine cultures of the 14 cases of septicæmia. In this group there were ten deaths—a mortality of 71·4 per cent. Nine cases had streptococci in the blood—in eight cases hæmolytic streptococci, and in one case non-hæmolytic streptococci. Seven cases with hæmolytic streptococci in the blood stream died and one recovered. The one case with non-hæmolytic streptococci in the blood recovered. There was one case with *B. coli* in the blood which recovered. In four cases the blood was sterile; three of these cases died and one recovered. Clinically all four were cases of septicæmia. Of the three which ended fatally, two gave a pure growth of hæmolytic streptococci from the uterus, and the third gave a pure growth of non-hæmolytic streptococci. The fourth case which recovered gave a pure growth of hæmolytic streptococci on uterine culture. The mortality of the cases in which streptococci were found in the blood stream was 77·7 per cent. Of uterine cultures taken from the 14 cases of septicæmia, 11 were found to give a pure growth of hæmolytic streptococci. The uterine culture was further examined for the causal streptococcus in eight of these cases, and *S. pyogenes* was found in every one. Two cases gave a pure culture of non-hæmolytic streptococci, one being *S. fæcalis*. One case gave a mixed growth of *B. coli* and *S. non-hæmolyticus I.*

CONCLUSIONS.

1. Hæmolytic streptococci are associated with the severe and fatal forms of puerperal infection, in which there is a complete absence of the less virulent organisms which are so closely related to the much milder forms of the disease. 2. The milder forms of puerperal infection are due to a localised uterine infection caused by a variety of organisms, including non-hæmolytic streptococci, *B. coli*, Gram-positive bacilli, and Gram-positive cocci (unclassified). 3. Uterine cultures are useful in forming a diagnosis and in giving a prognosis. 4. The prognosis is serious when *S. pyogenes* is obtained in pure culture from the uterus, as it indicates a virulent and severe infection. 5. The prognosis is fair, but must be guarded when non-hæmolytic streptococci are obtained from the uterus. 6. The prognosis is favourable when a mixed growth of organisms is obtained from the uterus, as their presence is associated with a mild and localised type of disease.

I wish to express my thanks to Dr. W. T. Benson, medical superintendent, Edinburgh City Fever Hospital, for his permission to carry out this study and for his ever-ready help.

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5. Holman, W. L.: Jour. Med. Res., 1916, xxxiv., 377.

NORTH STAFFORDSHIRE SMALL-POX HOSPITAL.—Two pavilions, containing 36 beds, have been added to Bagnall Hospital, which belongs to the North Staffordshire Joint Small-pox Hospital Board.

CLINICAL AND LABORATORY NOTES

NIRVANOL IN THE TREATMENT OF CHOREA.

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AND
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THIS paper gives an account of the effects of nirvanol on 15 cases of chorea. In the series the ages range from 6 to 21 years.

The severity of the disease has varied a good deal. Four grades have been arbitrarily represented by the figure 1 for the mildest, to 4 for the most severe. These and other points are set out in the Table.

REVIEW OF THE CASES.

History of Illness.—Thirteen of the 15 patients were suffering from their first attack of chorea. Eleven of these had been ill for less than four weeks. Two had been ill for six months and four months respectively. Thus it will be seen it is in early cases for the most part that the effect of the drug is illustrated.

The Action of Nirvanol.—The patient usually shows a reaction to the drug after a few days. This period, with ordinary dosage, is commonly of nine to eleven days' duration. It may be as short as six or as long as fifteen days. The phenomena of this "reaction" are remarkably variable. The syndrome which has been described as characteristic is said to have three features: (1) fever; (2) a quickened pulse-rate; (3) rash. In our cases this triad only appeared four times. But one or more of the symptoms are usually seen. For instance, in three patients the rash was present alone, in one fever and quickened pulse came without the rash, and once there was quickening of the pulse, and the rash appeared without fever. The temperature may rise to 102° F. The heart may accelerate to 120 or 140 beats a minute.

(1) No. of case.
(2) Sex.
(3) Age.
(4) Severity.
(5) Weight.
(6) Amount of drug (in grammes).
(7) Time before reaction (in days).
(8) Rash.
(9) Fever.
(10) Quickened pulse-rate.
(11) Increase in chorea before reaction.
(12) Drowsiness.
(13) Onset of improvement in days since drug started.

(1)	(2)	(3)	(4)	(5) st. lb.	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1	F.	12	3	6 5	2·65	9	+	+	+	+ +	+	14
2	F.	20	3	6 13	4·15	10	0	0	0	0	+ +	14
3	M.	8	2	3 11	0·9	6	+	+	+	+	+	11
4	F.	21	4	5 13	2·25	8	0	0	0	0	+	8
5	F.	8	2	3 5	2·7	9	+	+	+	0	0	13
6	F.	13	2	5 10	2·4	8	0	+	+	0	+	11
7	F.	19	2	7 2	7·2	15	0	+	+	0	0	gl.
8	F.	8	3	3 3	4·2	11	+	0	+	0	0	12
9	M.	6½	1	3 4	1·0	10	0	0	0	0	0	0
10	F.	14	1	7 2	1·5	10	+	0	0	0	0	10
11	M.	9	3	—	1·8	6	+	+	+	+	0	?
12	F.	13	2	—	1·8	10	+	0	0	0	0	11
13	F.	14	2	7 8	2·1	8	0	0	0	+	0	11
14	F.	18	3	7 10	3·9	10	+	0	0	+ +	+	10
15	M.	7	1	3 2	1·1	11	0	0	0	0	0	0

gl. = gradual.

The *rash* is a morbiliform eruption. It is not unlike that caused sometimes by sanocrysin. It does not always appear first in the same places. We have noticed it first on the trunk, chiefly the front, spreading to the face and limbs and back. The maculæ are reddish, bright at first, and then more dusky. Later they coalesce to a brilliant sheet of intense colour which is most pronounced on the extensor surfaces of the limbs. The buccal mucosa may be flushed and show tiny dewy vesicles. Irritation is not troublesome. Desquamation does not occur. The eruption usually begins to fade on the third day. The "reaction" lasts from three to four days.

Increase in the symptoms of chorea, which is sometimes seen, may be disturbing for two or three days before the "reaction." It may even occur when no reaction takes place.

Drowsiness was notable in six cases. In two it amounted practically to coma. On its appearance the drug was stopped and the symptoms of the disease cleared up. Three patients were drowsy and showed no further reaction.

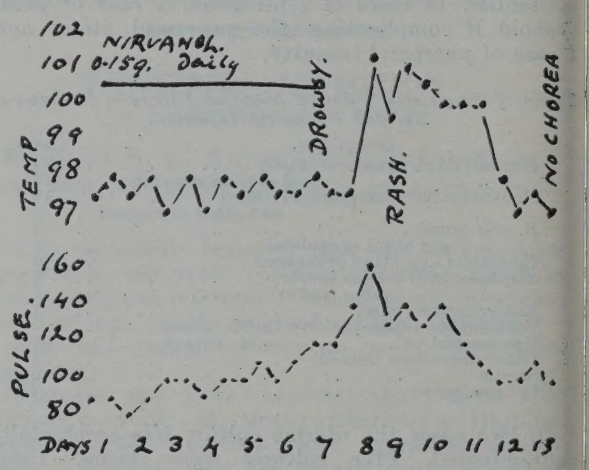

Chart showing effect of nirvanol in Case 5.

Improvement is usual, and took place 8 to 14 days after starting the treatment. It follows the reaction at once, though the reaction is not necessary to the improvement. Five did well without showing a rash. The symptoms cleared up quickly in three cases. The two patients who did not improve showed no response to the drug of any sort.

Dosage.—The drug was given by mouth twice daily. In three cases only was a daily dosage of 0·3 g. exceeded. To two of these 0·4 g. was given daily, and to one 0·5 g. The largest total amount given was 7·2 g., and the smallest 0·9 g. The drug was administered over periods varying from 6 to 15 days. A reaction, when it occurred, was a signal to stop the drug.

Unusual Effects.—In two cases a fall in pulse-rate was the only obvious form of response. In one patient 2:1 heart-block appeared for one day during the exhibition of the drug. It is worth noting that two patients developed rheumatic fever shortly after the nirvanol reaction.

Cardiac lesions were present in six of our cases and did not appear to be in any way affected.

Positive results.—Of the 15 cases, 12 were greatly improved, 1 moderately, and 2 did not respond.

CONCLUSIONS.

It is not possible to foresee what reaction the drug is going to produce. The symptoms of this reaction

may not be dangerous, but they are certainly at times disturbing.

The symptoms of chorea are improved and the attack is cut short in quite a dramatic manner in many instances. The question is whether it is right to use a drug which can produce so variable and uncertain a reaction to treat a disease which is said to be self-limited. The main justification would rest upon demonstration that the abolition of chorea prevented the onset of carditis. This still remains to be proved. We do not know that the rheumatic infection is abolished, in fact two of our cases point to the opposite.

For these reasons we think that the use of nirvanol should be restricted to cases which show no signs of improvement after four or five weeks' treatment on ordinary lines. It should only be used when constant supervision is available.

A CASE OF THROMBO-ANGIITIS OBLITERANS.

BY G. NORMAN CLARK, M.B. ABERD.,

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A MAN, aged 40, was admitted to the Hampstead General Hospital on March 6th, 1930, complaining of pain and swelling of his right leg.

ACCOUNT OF THE ILLNESS.

He had experienced pain on the outer side of the calf on sudden movement for the last seven years. In October, 1929, he had had similar pains on walking, and after being in bed an hour or so his foot had become numb. This numb feeling had been relieved by hanging the leg out of bed. A month later there was constant pain in the foot, which was pink and swollen. On account of the swelling and pain he had remained in bed from the middle of December until the end of January, but there had been no improvement in his symptoms. Since then the pain, redness, and swelling had been getting worse. His previous health had been quite good. He was not a drinker but smoked between 25 and 30 cigarettes a day. He had been a keen hockey player since the age of 16 and had been goalkeeper at football for the last 15 years. He could not trace any Jewish ancestry.

He was a well-nourished healthy-looking man. There was marked swelling of the right foot and leg with redness of the toes and the distal part of the foot. The swelling pitted on pressure and on elevation of the limb the redness faded away, the limb becoming quite blanched. There was a discharging area on the plantar aspect of the little toe which had been incised three weeks previously, a misdiagnosis of sepsis having been made. The outer aspect of the little toe was painful and tender and there was an indurated tender area with redness of the skin on the inner aspect of the right calf. Below the inner tuberosity of the tibia there was a patch of phlebitis of the long saphenous vein which was painful and very tender. Pulsation could not be made out in any of the arteries of the legs distal to the femorals in Scarpa's triangle. The right pulse at the radial was weaker than the left, which could be felt readily. No pulsation could be felt in the antecubital fossæ. The blood Wassermann and Meinicke reactions were negative and a radiogram of the leg showed no evidence of calcification of the arteries. The heart sounds were weak but no murmurs were heard. His blood pressure was 115 mm. systolic and 75 mm. diastolic.

The pain was very severe while in hospital, being relieved by hanging the leg out at the side of the bed; even nepenthe ℥x. at night did not relieve it with any certainty. Ultra-violet light was tried locally, with temporary relief of the symptoms.

On March 31st the swelling was more marked, and extended up beyond the middle of the leg, and the pain was so severe and constant that the patient wished to have his leg amputated. Injection of the short saphenous and plantar nerve to the outer side of the little toe with 0·5 c.cm. and 0·25 c.cm. of absolute alcohol respectively gave him temporary relief from the pain in the little toe.

Amputation above the knee was done on April 8th by the long anterior and short posterior flap method. The wound healed well and the patient had an uneventful convalescence except for occasional "phantom pains." He was discharged on April 30th.

The arteries of the amputated limb and the short saphenous nerve at the point of injection were dissected out; likewise the thrombosed segment of the long saphenous vein below the internal tuberosity of the tibia. There was considerable difficulty in dissecting out the vein, which was bound down to the surrounding tissues.

PATHOLOGICAL REPORT.

Dr. C. R. Lane reported on the condition as follows:

The popliteal artery is occluded by a thrombus one inch below the line of amputation; above this there is no thrombus. At the point where it is occluded the adventitia is thickened and tends to merge into the surrounding tissues; the vasa vasorum show a little endarteritis and periarteritis, but these are far from being marked; where they do occur, increase in elastic tissues is marked. The media shows intense degeneration of the muscle, especially internally, being replaced, not by fibrous tissue, but by elastic tissue apparently derived from the elastic fibres of its innermost layers. Its vasa vasorum are dilated. The internal elastic lamina is reduplicated and markedly fragmented in places. The intima is merged into the thrombus, which is completely organised and consists of fibrous tissue, in places hyaline, with many small vessels showing endothelial and muscular coats with little or no elastic tissue. Nearest the internal elastic lamina the thrombus shows an enormous amount of elastic tissue, apparently derived from the internal elastic lamina. In the centre are cells bearing altered blood pigment.

In the region where the popliteal artery is patent there is some endarteritis, again with much elastic tissue and reduplication of the internal elastic lamina. There is degeneration of the media, especially internally, with a good deal of elastic tissue, but also some loose fibrous tissue; the adventitia is well defined. The vasa vasorum do not show endarteritis. The popliteal vein shows endophlebitis, mainly due to increase in elastic tissue in the subendothelial region. It is patent but shows commencing thrombus formation.

The anterior tibial artery shows marked canalisation of the thrombus and rather more endarteritis of the adventitial vasa vasorum, but otherwise a similar great increase and reduplication of elastic tissue. There is endophlebitis of the venæ comites. The dorsalis pedis artery is not blocked, but there is marked narrowing of the lumen by increase of the subendothelial tissue, largely by elastic tissue. The media is fairly well preserved. There is increase of the elastic tissue of the adventitia. Endarteritis of the vasa vasorum is not marked. The posterior tibial artery and its branches are not blocked; they show similar changes to the dorsalis pedis artery but with less elastic tissue. Endarteritis of the vasa vasorum is more marked. The internal plantar artery is similar to the dorsalis pedis. The external plantar artery is also similar to the dorsalis pedis, but the subendothelial tissue shows extensive canalisation. One vein is also in a similar condition, but the subendothelial tissue is more fibrous and has very little elastic tissue. The long saphenous vein contains an extensively canalised organised thrombus showing much elastic tissue; there is considerable diffuse round-celled infiltration round the vasa vasorum. The short saphenous nerve shows considerable fibrosis with destruction of nerve-fibres.

Apparently the condition was an affection primarily of the elastic tissue and intima, the effects on the media being secondary. Great increase of elastic tissue is not usually described in thrombo-angiitis obliterans, but the more advanced stage seen in the popliteal artery is the usual finding in that disease.

I wish to thank Mr. W. H. Ogilvie, who had charge of the case, for his kind permission to record it, and Dr. Lane for permission to publish his report on the microscopic findings.

SMOKING IN HOSPITAL WARDS.—In future male patients in Bath Royal United Hospital are to be allowed to smoke in the wards between 7 and 8 A.M., 1 and 2 P.M., and 6 and 7 P.M. The resident medical staff are, however, empowered to prohibit smoking when it appears likely to be prejudicial to the health of any patient.

REVIEWS AND NOTICES OF BOOKS

Epidemic Encephalitis.

ETIOLOGY, EPIDEMIOLOGY, TREATMENT. Report of a Survey by the Matheson Commission. New York: Columbia University Press. Pp. 849. 15*s*.

WE know from Sir Thomas Browne that "some allow that such diseases which are esteemed new will have but their time." Neurologists are already beginning to apply this dictum to epidemic encephalitis as they mark a progressive diminution in hospital and clinic of cases of the disease. Yet it is too early to look upon epidemic encephalitis purely as medical history; 1037 cases of the disease were notified in England and Wales during the year 1929. Whether or no epidemic encephalitis is to become a tale that is told it is of paramount importance to collect all available data about its manifestations. Mr. William J. Matheson decided to have the information scattered in journals or monographs in every language brought together and tabulated so as to be generally available. With his financial support and at his instance a Commission was appointed to represent the laboratory, clinical and epidemiological points of view. The actual detailed work was done by Dr. Josephine B. Neal, who analysed the 428 pages of the bibliographical section of the report, and also visited England and the continent of Europe in order to confer personally with the chief workers on epidemic encephalitis. The result of the Commission's labours is this book, which, illustrated by many statistical tables, charts, and diagrams, has assembled in succinct form the known facts relating to the manifestation of epidemic encephalitis throughout the world.

For the most part the Commission have desired to put evidence before the reader without drawing any very definite conclusions. This is particularly to be remarked in the epidemiological section. The examples of epidemic outbreaks and of apparent case-to-case infection are cited side by side with instances of outbreaks in which no such association is manifest. Reference might have been made to the views which harmonise these apparent discrepancies by adducing data relating to mild and abortive cases of epidemic encephalitis and the possibility of "carriers" of the virus. On the analogy of two other epidemic diseases of the central nervous system —cerebro-spinal meningitis and acute poliomyelitis— it seems likely that epidemic encephalitis is infective and liable to manifestation in epidemic form. A chapter is devoted to other types of encephalitis, including post-vaccinal encephalitis. More information is certainly required not only about the pathology and symptomatology of the forms of encephalitis which follow on acute infectious diseases, notably measles and small-pox, but also (as the work of W. R. Brain and others indicates) about the sporadic and epidemic forms of encephalitis which now occur with greater frequency in our midst. The problem of the ætiology of post-vaccinal encephalitis is still unsolved. Some consider it possible that vaccination produces diminished resistance to disease and that an organism of encephalitis, already present without causing any symptoms, becomes pathogenic; others believe that the condition is due to the introduction of a neurotropic virus with vaccine lymph.

We are glad to note that the Matheson Commission is continuing its work on epidemic encephalitis and that the results of further studies of the causes, treatment, and sequelæ of the disease will be published from time to time.

Diseases of Women.

Fourth edition. By Ten Teachers under the direction of COMYNS BERKELEY. Edited by COMYNS BERKELEY, H. RUSSELL ANDREWS, and J. S. FAIRBAIRN. London: Edward Arnold and Co. 1930. Pp. 558. 18*s*.

AMONGST the text-books commonly used by medical students, Diseases of Women and its companion volume Midwifery by Ten Teachers rank second to none in popularity. Collective authorship necessarily involves compromise over debatable points and this in turn usually means that the product lacks those dogmatic statements which are essential in all elementary teaching. In this book, however, the student will have no difficulty on this score although in later life he may find that he has to revise some of his ideas. To get representatives of nine London schools to agree to a uniform teaching is a triumph, and even a greater one when agreement can be maintained over a term of years. In this edition the whole book has been completely revised, and recent work has been incorporated in the text. The authors have restricted the additions as far as possible to established facts and have avoided theories and contradictory statements. This treatment of new work may seem unsatisfactory to the specialist, but it greatly simplifies the subject for the average student for whom the book is written. The treatment of carcinoma of the cervix is not very clearly described. Technical details are given of both operative and radiological methods, but the student is left without any guidance about the relative positions these two lines of treatment hold in this and other countries. A great reduction in the weight of the book has been brought about by the use of lighter paper.

The student will find no better text-book to help him through his examinations, and in later life he will find it an equally valuable friend in practice.

Introduction to Human Parasitology.

By ASA C. CHANDLER, M.S., Ph.D., Professor of Biology, Rice Institute, Houston, Texas. New York: John Wiley and Sons; London: Chapman and Hall, Ltd. 1930. Pp. 655. 25*s*.

THIS book is an elaboration of one entitled "Animal Parasites and Human Diseases" by the same author written 12 years ago. It is pleasant to see recorded the assistance he has obtained in the interim from the *Tropical Diseases Bulletin* among other journals. Prof. Chandler has produced a sincere and readable book, not overburdened with tiresome details on human parasitology. Throughout the work special emphasis has been laid upon the biological aspects of the subject, and considerable space has been devoted to life-cycles, epidemiological factors, and underlying principles of treatment and prevention. The introductory chapters on parasites are good and we may note that in the controversial subject of nomenclature no attempt has been made to give a synonym, but, whenever there has been disagreement between European and American usage the latter has always been adopted. Prof. Chandler is patriotic enough even to countenance the inclusion of *Councilmania* as a well-established genus of amœba parasite in man; some may regard him as uncritical for including bronchial spirochætosis as a distinct

entity, attributed to a specific organism, *Treponema bronchiale*. The illustrations are a little disappointing, both in number and in quality. Fig. 287 is a caricature of *Aedes calopus* (sic), the yellow fever mosquito, which is quite out of proportion. Why should it be named *calopus* on one page and *aegypti* on the next?

We have recently had occasion to welcome standard works on modern protozoology, medical entomology, and helminthology in the English language. The production of a comprehensive work on human parasitology is timely, and this volume gives clearly and with good judgment all the information which readers will seek to find in its pages.

Psychology, Normal and Abnormal.

By J. W. BRIDGES, Professor of Psychology in the Faculty of Medicine of McGill University. London: D. Appleton and Co. 1930. Pp. 532. 12*s*. 6*d*.

THIS is one of the most comprehensive text-books of psychology that has appeared for some time past. In a brief opening chapter the author defines psychology from various aspects, and relates it very ably to the related sciences of biology, the normative sciences, other mental sciences, and the pseudo sciences (spiritism, &c.). He then defines the relation of normal to abnormal states in a succinct manner, and discusses the philosophic foundation of the subject. The neurological substratum or correlates of mental activity and behaviour are considered at some length and a systematic study on orthodox lines is made of functions. The relationship of functions to applied psychology and psychopathology are critically examined. The references to psycho-pathology throughout the book are considerable though necessarily brief.

Students of medicine who are not to be satisfied with oddments of psychology will find the book interesting and informative.

Treatment in General Practice.

By HARRY BECKMAN, M.D., Professor of Pharmacology at Marquette University, Milwaulkee, Wisc. London: W. B. Saunders Company. 1930. Pp. 899. 45*s*.

DURING the past 15 years applied physiology has steadily come into its own by the orderly filling up of the breach between medicine and physiology, but therapeutics has been largely excluded from this happy union. Medical men have, in consequence, fallen back according to their individual temperaments either upon therapeutic nihilism or, contrariwise, upon the easily assimilable brochures provided by enthusiastic theorists or industrious manufacturers. Dr. Beckman in this outstanding book steers a course from which both these points of view are excluded. Being both pharmacologist and physician, he is in a position to do so. And yet, great as has been and is the need for the literature of applied pharmacology, this book is more than that. It is a most painstaking and exhaustive analysis of orthodox and putative therapeutics in medicine (surgery and midwifery are not included), written critically and giving details of technique and dosage. In the preface Dr. Beckman decries the current principle that the art of treatment "comes" if only one has mastered the art of diagnosis, and the book is an attempt to shake, however feebly, the false foundations of such beliefs. Yet nowhere in the book will it be found that the treatments discussed are independent of diagnosis properly made. This tribute should not be taken to imply that students will find here any rule-of-thumb index of treatment. Far from it: the book is one written by a tutor and not by a "coach." Two full pages, for instance, on the successful treatment of diabetes mellitus by myrtillin will certainly not be found to be lightly transferable to a daily prescription sheet, and the section on asthma will probably leave the average doctor wiser chiefly by his increased recognition of the darkness surrounding the subject. But, nevertheless, many refreshing passages should help him to increase the efficiency of his armamentarium in the treatment of hæmoptysis, syphilis, chronic nephritis, herpes zoster, eczema, and a host of other diseases when diagnosis has been established.

This book or its equivalent should be in the hands of every physician, and we have not yet come across its equivalent.

Radiographie néphro-cholécystique.

By M. DE ABREU, del'Institut Brésilien de Sciences et de L'Académie de Médecine de Rio. Paris: Masson et Cie. Pp. 157. Fr.40.

THIS monograph contains only 23 pages of text, the rest of a considerable book being devoted to illustrative cases and a short résumé. The author has evolved an original technique for the differential diagnosis of renal and biliary stones, and other intra-abdominal shadows; he does not discuss the numerous methods already employed. In most cases this differential diagnosis is not a difficult one, but it must be admitted that there are cases which give rise to doubt. In these the author suggests that a profile view, with the X ray beam passing through the plane of the kidney from the pelvis to the posterior border will completely separate the shadows of the kidney (and any stones it may contain) from the shadow of the gall-bladder. This picture is, of course, through the maximum diameter of the kidney, and therefore should give a renal shadow of maximum density. The profile view of the kidney is obtained by rotating the patient on the couch to an angle of approximately 45 degrees, and the author claims that this position also frees the kidney shadow from that of the psoas muscle and air shadows in the bowel. The value of serial radiograms at 10 degrees of rotation is pointed out. Some 54 illustrative cases are included which are well reproduced, and help to support the author's contentions.

The book should prove of interest to all radiologists interested in urological diagnosis.

Procedure in Examination of the Lungs.

By ARTHUR F. KRAETZER, M.D., Chief, Medical Department, New York Skin and Cancer Hospital. London: Humphrey Milford, Oxford University Press. 1930. Pp. 125. 8*s*. 6*d*.

THIS book is written as a practical manual for students. The author wisely insists on the importance of understanding the normal before trying to study physical signs in disease, and the student is told how to examine a normal chest and compare one area with another. The different signs and symptoms are then described, and the reader is warned to be methodical and not to take one striking sign, base a diagnosis on it, and build up other signs of doubtful

value to suit the diagnosis. Dr. Kraetzer considers the coin sound a detestable sign. A student given a case of pneumothorax may "get a fool hunch right at the start and look for the coin sound," thus avoiding the routine examination that should have led to the diagnosis. When dealing with tuberculosis the author gives much commonsense advice. The presence of serous effusion means tuberculosis, "unless you can disprove it, and the odds are a hundred to one you cannot."

The book is written in a very light and almost conversational style, but contains many valuable hints on the interpretation of signs and symptoms of pulmonary disease.

Elektrotherapie.

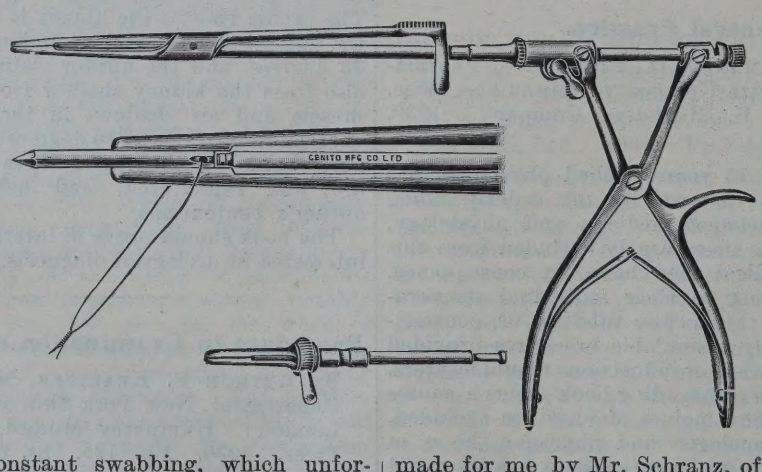
Third edition. By Dr. JOSEF KOWARSCHIK, Head of the Institute of Physical Therapeutics of the State Hospital, Vienna. Berlin: Julius Springer. Pp. 312. M.22.60.

THE second edition of this book was written six years ago. The present edition contains less electrotechnical detail, and the space thus saved has been utilised for the addition of the more recent advances in electrical treatment. The size of the book remains the same. The new material includes a brief account of the chronaxie and its possible uses in electrodiagnosis. In the section on diseases of the alimentary system there is a short description of the use of diathermy in some of the diseases of the gall-bladder; this form of treatment is recommended in cases of chronic inflammation, especially where there is painful spasm, and when adhesions are present. In the pages devoted to treatment of diseases of the skin the author describes the use of diathermy in place of the galvanic current for destroying superfluous hair follicles; and he comments favourably on the work of others in the treatment of keloid, X ray ulcers, and acrodermatitis atrophicans by diathermy. In selecting the diseases for which electrical methods of treatment can be recommended and in describing the results which may be anticipated, Dr. Kowarschik speaks with praiseworthy restraint. He might well have written more about electrical methods in diseases of women. Only four pages are devoted to this subject, and these are placed at the end of the section on diseases of the urogenital system. This short account is quite inadequate in view of the importance of the subject. A new expression, not familiar to English readers, is used for the treatment introduced by the late Prof. Bergonié. Just as the words "Franklinisation" and "d'Arsonvalisation" were introduced to describe certain forms of treatment by static electricity and by high-frequency currents, the expression "Bergonisation" has been coined to signify the treatment in which the muscles of the limbs and trunk are made synchronously to contract and do work. These are long words, but they serve to keep in memory the work of three very distinguished pioneers.

NEW INVENTIONS

A RADIUM NEEDLE INTRODUCER.

WHEN radium needles are being placed around and into malignant growths, much time can be saved and the work much simplified if each needle can be introduced and fully embedded in one act. The usual procedure is, of course, to enter the needle as far as the needle-holder permits and then to embed it by means of a special "pusher."



The object of the instrument here depicted is to do this in one instead of two movements. I designed it primarily for use with bladder and prostatic carcinoma; in these cases the work has to be done at the bottom of a cavity where visibility can only be obtained by constant swabbing, which unfortunately often dislodges the needles and yet is necessary if the pusher is to be fitted on to the needle. This instrument can, however, be used for implanting any needles into any growth to which direct access is possible. Needles of various thickness and length are easily put into the jaws of one or other of the holders, all of which fit on to the same handle. When using the instrument, the needle held in it is driven into the tissue by pushing, and then, whilst a firm pressure is maintained, the handle is closed, and thus the needle is propelled for the last part of its course and buried entirely beneath the growth's surface. In dealing with very dense tissues it is particularly important to maintain a very firm pressure whilst pushing, and thus to ensure that the point of the instrument is kept in close contact with the surface of the growth or skin overlying it.

The principle on which the instrument works can be seen from the detailed drawing; the pushing rod ends in a truncated cone which, on closing the handles, enters and slightly opens the jaws holding the needle and in the same movement forces it forwards.

The instrument has been carefully made for me by Mr. Schranz, of the Genito-Urinary Company. It consists of a handle and three extensions for work at various depths and adapted for various lengths of needles. There is also one very short extension for superficial work; only this latter and one longer are figured.

R. OGIER WARD, M.Ch. Oxf., F.R.C.S. Eng.,
Assistant Surgeon, St. Peter's Hospital; Surgeon in Charge, Genito-Urinary Department, Miller General Hospital.

THE LANCET.

LONDON: SATURDAY, JULY 26, 1930.

ANÆSTHETICS IN CHILDBIRTH.

THE appeals in the lay press for funds in order that every woman in hospital who desires it may have an anæsthetic to dull the pains of childbirth have stimulated public imagination, and expressions of medical opinion on this subject are being sought especially from obstetricians, anæsthetists, and general practitioners. In the current number of the *British Journal of Anæsthesia* a leading article is devoted to the question whether our maternity service would be improved by the provision of anæsthetics. The point of view adopted is that the present lack of such provision is mainly a financial question, but is also due to a "dormant obstetric conscience." Many women do not ask for an anæsthetic because they have no idea that labour pains can be alleviated without damage to themselves or to their child. As a matter of fact, quite apart from the humanitarian aspect of the question, the use of anæsthetics in labour has definite obstetric advantages. The memory of unrelieved pain in a first labour causes in many women grave apprehension of the coming ordeal in subsequent pregnancies—a quite unnecessary additional strain which does not conduce to the welfare of either mother or child. Again, if pain is duly relieved, and the patient's condition during labour gives no other cause for anxiety, doctors and relatives are likely to agree to let delivery be spontaneous, whereas if the woman is distressed it is common for the patient's friends to beg the doctor to force the pace by forceps delivery. The most marked advantage noticeable at the end of a labour which has been made painless is the absence of shock or exhaustion.

But if such relief from the pains of childbirth is to be given, certain safeguards are necessary. It is obvious that when the patient is under the influence of a drug and can make no complaint, more, and not less, systematic skilled obstetric observation is required if the progress of normal labour is to be distinguished from one in which difficulty is arising. A careful watch must be kept on the character of the pains and on the progress made; signs of exhaustion in the mother or of adverse effect on the child must be looked for, and this demands a skilled attendant with much time at his disposal and much patience. A real risk connected with the use of anæsthesia in labour assumed to be normal may arise from a desire to leave the mother's rest undisturbed, thus allowing danger signals to pass unnoticed. No difficulty occurs with those patients who can afford a long period of vigilant care from both accoucheur and anæsthetist; nor should it arise in maternity hospitals where sufficient personnel is available. There are, indeed, good reasons for hoping that the public will find generous support for the funds designed to enable anæsthetics to be given in lying-in hospitals. First, there is the fact that here, at least, one can provide relief of pain without increasing the danger; secondly, the medical student and midwife learning their jobs on anæsthetised patients are likely to retain the sympathetic outlook with which they enter hospital, and will not steel themselves deliberately to disregard cries and expressions of agony as inevitable accompaniments of the process of childbirth; thirdly, research will be stimulated, so that relief which is now feasible only inside the hospital walls will eventually be provided for women confined at home. How this blessing could be achieved will remain a problem at least until the present range of anæsthetics has been more thoroughly explored with this end in view, and probably until the range has been extended. The suggestion has been made that anæsthetists might themselves discuss the possibility or desirability of training in anæsthetics a certain number of midwives who are also fully qualified nurses. It is acknowledged that nurses have been successfully employed as anæsthetists in the United States, even for operations involving full surgical anæsthesia, but the best medical opinion in this country has always been opposed to the admission of anyone but a qualified doctor to the ranks of those allowed to give anæsthetics for any purpose whatsoever. It is obvious that the doctor who conducts a forceps case without the help of a colleague must entrust the administration of anæsthesia to the nurse, but he is in the room and in an emergency can, and often does, leave his obstetric operations to attend to the mask—sometimes to have to return to them without washing up. A very great improvement in the general education of the nurse-midwife would be required before the authorities could be asked seriously to discuss her training as an anæsthetist, and this possible solution must be dismissed as impracticable with the anæsthetics at present on the market.

There remains the hope that some new methods of analgesia in labour may be discovered. In our present issue Mr. J. S. M. CONNELL reports on his experience of the use of avertin in some 50 cases. He does not claim that the drug ensures a painless labour, but that by its use "it is possible to make things so easy for the patient that she has no devastating pain, no prolonged backache, no exhaustion, and no memory of a terrible experience to jaundice her outlook on life." Admittedly the drug has drawbacks and dangers, and Mr. CONNELL suggests only that it is worthy of trial by the practitioner. If this is so, it is also worthy of inclusion among the drugs being tested by Mr.

ALECK BOURNE and Dr. J. H. BURN for their action on the human uterus.[1] A simple apparatus for recording graphically the changes in the uterine pressure taking place during labour has enabled them to show the effect on the behaviour of the uterus of chloroform, ether, nitrous oxide, stovaine, morphine, atropine, and quinine. Their conclusions are that: (*a*) The administration of chloroform or ether on an open mask at once arrests the contractions in the first stage, and diminishes their force and frequency in the second stage. The effect comes on rapidly, and passes off rapidly when the administration is discontinued. (*b*) The administration of gas and oxygen has no effect on the contractions during labour. (*c*) Stovaine (intraspinal) does not inhibit the contractions, but interferes with full relaxation between the pains. This appears to be due to continuous contraction of the lower segment, and if stovaine be given early in the first stage dilatation will be delayed. (*d*) Morphine lessens the frequency of uterine contractions, but the pains pass off more slowly, so that the work done by the uterus is probably as great as or greater than before, despite the lessened frequency. (*e*) Atropine appears to stimulate the contractions of the uterus. It certainly has no inhibitory action. (*f*) The stimulant action of quinine during labour is very small. The most important of these conclusions from the point of view of those who are eager to secure painless labour for women in lying-in hospitals is that which acquits gas and oxygen of any deleterious effect on the contractions of the uterus. The apparatus is cumbersome, the administration requires experience and skill, and the depth of anæsthesia attainable may not suffice to make the actual delivery painless. But the very fact that one form of anæsthesia has been proved to cause no delay in parturition will encourage the search for others equally harmless which can be more easily administered. The pioneer work of Mr. BOURNE and Dr. BURN has initiated a new and valuable method of approach.

SURGICAL BIOGRAPHY.

THERE has just been published an alphabetical series of biographies of the Fellows of the Royal College of Surgeons of England covering the period from the institution of the order of Fellows in 1843 down to 1922, when VICTOR PLARR, their author, died after a short illness. PLARR, it will be remembered, was librarian of the College for over 30 years and these important volumes[2] form a fitting testimonial to his industry as well as to his literary capacity. That there should be published by the College a biographical record of its Fellows was proposed originally in 1912 by Sir JOHN BLAND-SUTTON, and again when he became President of the College, knowing that PLARR had already started on the work. The obituary notices which had appeared in THE LANCET were, in the initial stage, PLARR'S inspiration, as he frankly said, while at that time the question of money precluded the College from publication, although PLARR continued to add to his notes. But recently the Council of the College, under LORD MOYNIHAN'S Presidency, invited Mr. D'ARCY POWER, Mr. W. G. SPENCER, and Prof. GASK, who had been members of the Library Committee of the College, to revise and prepare PLARR'S M.S. for printing and publication, since when other sources of information have been drawn upon. The cost of issue has been defrayed from a legacy of £5000 made to the College by the late Mr. THELWALL THOMAS, and the volumes for this reason bear the name of that well-known surgeon and generous man.

The lives of the Fellows form a valuable record of the progress of surgery at the hands of its best known exponents during the past 90 years: the appellation "best known" can be justified on the law of averages, and does not suggest that the Fellows of the other Royal Colleges have not produced corresponding leaders of their art, many of whom incidentally fall for mention in the English series. By the publication of these biographies the period of some 90 years of surgical history is bridged over, and largely by the solid construction of contemporary recollection, for here we find set down many things known personally, and few things that have not been received by their retailers at first or second hand. This position has, of course, its drawbacks as well as its advantages, for it is thus inevitable that the note of the work should be one of eulogy. How could it be otherwise when the main source of information has been the biographies published in the medical press during the week of the demise, while in many instances relatives, perhaps quite near relatives, of the dead man will still be living? In certain instanees the monotonous note of appreciation detracts from the value of the compilation, omissions made from delicacy marring the accuracy of the record, but it is good to know that these reservations are not to be deplored in the case of anyone who really counts in the history of his science. The disregard for proportion in the length of the obituaries would, again, be an easy matter to criticise, but much interesting reading is due to this very absence of symmetry, for some of the longer obituaries owe their length not so much to the eminent professional position of their subjects as to the accident of association with some notable circumstances outside the profession.

It is intended to issue supplementary volumes every ten years, and it will be advisable that these should contain revisions as well as additions. It will be of real use to the writers of medical history if those who have access to information which would enable some of the more meagre entries to be supplemented would communicate with the Librarian of the College, and would clothe certain skeletons with their appropriate tissues. The period over which retrospection has to extend is so brief that it seems probable that there lies to hand much of the necessary information.

[1] Brit. Med. Jour., July 19th, 1930, p. 87.

[2] Thelwall Thomas Memorial: Plarr's Lives of the Fellows of the Royal College of Surgeons of England. Bristol: John Wright and Sons; London: Simpkin Marshall, Ltd. 1930. Two vols., pp. 752 and 596. Price, 42*s*. cloth; 57*s*. 6*d*. half bound.

A GENERAL MEDICAL SERVICE.

THE possibility of a State medical service with its attendant bureaucratic control has begun to haunt the medical profession of recent years. Whether or not this spectral presence has moved the British Medical Association directly to draw up a scheme for a general medical service, it has certainly had a definite and material influence in the matter; for it is with the sentiment that offence is the truest defence that some constructive proposals have come from the Council of the Association. If the State should extend the scope of clinics and centres, and further absorb the work still carried on by the general practitioner, it is clearly desirable that the medical profession should be able to offer some basis for a scheme in accordance with its own views and traditions, things which State organisation might disregard.

The details of any such scheme will necessarily call for close scrutiny and wide discussion before actual trial, while modification after the scheme has been put into practice—if ever—may be needed; but the Representative Meeting of the Association indicated accurately the possible reactions of the general practitioner to certain of the Council's proposals, and in so doing has also informed the public of much that matters. The position of the medical officer of health in the scheme was the subject of much debate. The proposal of the Council that he should act as liaison officer between the local general practitioner and the local authority was challenged by Dr. E. R. FOTHERGILL, on the grounds that it was possible that not all medical officers of health were in perfect accord with the general practitioners in their district. This is an old story, and, as far as we know, it has received no new support from actual events, but Dr. H. J. MILBANK-SMITH advocated the formation of a statutory medical committee for the area to consult with the medical officers of health on matters affecting the local practitioners. The proposal to form such a committee was inspired by the feeling that the M.O.H. would probably meet the local authorities only three or four times in the year, and yet would be in a position to make decisions affecting the welfare of local practitioners in which they could have no dissentient voice. The opposite point of view was put very ably by Dr. J. MIDDLETON MARTIN, who felt the interests of the profession to be a concern which the medical officer of health would have at heart; he spoke feelingly of the difficulties of administration cumbered by too many opinions, and rather gave the impression that medical officers of health were guardian angels brooding over the welfare of practitioners in their area. Dr. D. O. TWINING's conception of them was rather different and he classified them either as Mussolinis or mice; but, like Dr. FOTHERGILL, he felt disinclined to confide the welfare of the general practitioner to either group. The meeting agreed that the local medical advisory committee should have direct access to the local authority without the intervention of these third parties.

In his introductory speech Dr. BONE made it clear that the financial aspect had been purposely excluded from the proposals, but it was felt that these would be incomplete without some tentative reference to the probable cost of the scheme. In a separate section of the proposals this has been attempted in figures on a basis of calculations made by the Royal Commission on National Health Insurance of 1926, and the following figures are quoted from that reference: the cost of extension of the present National Health Insurance Scheme to dependents of insured persons (£9,500,000); a consultant and specialist service for present insured persons (£1,290,000); laboratory aids for present insured persons (£100,000); making a total of £10,890,000. The British Medical Association's estimate of the cost of its Maternity Scheme was approximately £2,250,000. Against these figures are certain "set-offs," notably the whole cost of the present additional treatment benefits given under the National Health Insurance. The amount spent in this way in 1928-29 in England alone was £3,622,869. As Dr. J. W. E. CORY pointed out at the meeting these figures are by now somewhat out of date and their deletion from the proposals was considered. It was felt, however, that in being asked to discuss any scheme of this kind the public should be given some idea of the cost even if it could not be assessed with complete accuracy, and the meeting decided to retain these paragraphs as they stood.

The proposals as a whole make a basis for a complete scheme which, considering its extent, should not prove unduly costly if the financial estimates are at all sound. The London Public Medical Service, now in action in Kensington and Paddington, forms an interesting practical experiment of the application of such a scheme on a small scale. Part of a motion containing a reference to it was ruled out of order by the chair in the position in which it was introduced, but some further reference will doubtless be made to it in the course of the meeting. The Council's proposals cover a wide field and make provision for all classes of patients, including the indigent. Only experiment can prove the value of the scheme as a practical measure.

THE OSLER CLUB.—The Osler Club celebrated on Saturday, July 12th, the eighty-first anniversary of the birthday of Sir William Osler. Prof. Harvey Cushing, having been welcomed as a "Friend of the Club," gave an informal oration in which the charm and whimsicality of Osler's personality was well brought out. He told of the early Western days, of Father Johnson and of James Bovell, and of how, under their influence, Osler turned from the church to medicine. He also let his audience into the method employed in writing his great life of his friend and master. Dr. Arnold Klebs, Sir Arthur Keith, Sir D'Arcy Power, Dr. Henry Wellcome, and Mr. Philip Franklin then entered on a lively discussion of Osler as physician, author, and man, until Mr. W. R. Bett remembered that it was "long past Osler's bedtime," and wound up the proceedings with a tribute to the influence of Cushing's "Life of Osler" upon the later generations of medical men. Before the oration the club entertained Prof. Cushing to dinner at the Langham Hotel.

ANNOTATIONS

THE TRAFFIC IN DANGEROUS DRUGS.

THE tenth assembly of the League of Nations last year approved the principle of limiting the manufacture of dangerous drugs as foreshadowed in The Hague Convention of 1912. The council of the League, last May, at its fifty-ninth session, approved a plan which is to be submitted to an international conference to be held next December. Meanwhile the recent issue of a report for the year 1929 by the British Government shows how by the Dangerous Drugs Acts 1920–25 illicit traffic has been brought under control in this country. While seizures of contraband have been relatively few and far between in Great Britain, reports from the Dominions and Colonies and from several foreign countries afford disquieting evidence of widespread illicit traffic abroad. International coöperation, as contemplated by The Hague and Geneva Opium Conventions, has not been effective, and indeed some important countries have not even troubled to reply to letters addressed to them. Nevertheless, it is satisfactory to learn that the exports of British-made morphine and its salts, which some years ago amounted to tons, last year totalled 42,331 ounces, a decrease of 7492 ounces on the previous year. The consignment to France was nearly 5000 ounces less than in 1928. Three-fourths of the raw opium imported for medicinal purposes now comes from India and only about one-fourth from Turkey, while Persian opium has practically ceased to be employed. The report states that "as prepared opium (i.e., opium for smoking) is totally prohibited in Great Britain, all quantities seized are destroyed" and "active police measures are taken to detect infringements of the law." Such commendable vigilance here contrasts with the continued exports from India of "prepared opium" for smoking purposes, yielding a not inconsiderable revenue to the Government. In 1928 cocaine was for the first time manufactured under licence in this country, and in 1929, 9326 ounces were so manufactured against 4934 ounces in the previous year, the imports of the alkaloid showing a corresponding decline.

It would be well if all the high contracting parties to The Hague and Geneva Opium Conventions would furnish as precise and satisfactory reports as that just issued by the British Government. Official statements from the League of Nations, however, bear witness to the widespread and dangerous extent of the illicit traffic in opium, morphine, heroin, and cocaine, as well as to the ingenuity and resource of the organisation for this clandestine commerce. The advisory committee on opium at Geneva, which has been labouring for the last ten years, is to have an infusion of new membership, while the Permanent Central Opium Board has, in the five sessions it has held, found it difficult to compile statistics of illicit traffic owing to the failure of producing countries to furnish complete returns. No machinery which can be contrived to grapple with this complex problem will be effective unless and until the nations, which have solemnly pledged themselves to effectuate treaties, enact and enforce the legislation which such treaties imply.

HEALTHY SLEEP.

IT is an ancient jest about the disagreement of doctors that their advice on the best position in which to sleep is so positive, and at the same time so various, that the only thing to do is to remain stark, staring, wide awake. This is no libel, for in actual fact three American doctors have found in the literature vigorous reasoned advice against sleeping in every possible position. Some postures are said to produce deformities and other to correct them, and every posture in turn is accused of interfering with the action of the heart, stomach, or respiration.[1] The United States army urges its soldiers never to forget that "the best way to use the body for all purposes is as if it were stretched up as tall as possible"; during sleep they are not to "curl up and buckle" in the middle. Yet other authorities recommend a curled-up position, and this at least seems more reasonable, since the "position of rest" for all parts of the body is one of flexion, following the rule that the flexor muscles are slightly more powerful than the extensor.

Where such differences exist it is obvious that someone has based an opinion on inadequate evidence. It is easy enough for the physician to notice that two or three patients with a certain disease state that they always sleep in a certain position, but to give the position an ætiological importance on these grounds is unjustified. There are two fallacies: one is the lack of adequate control experiment and the insufficiency of numbers, and the other is the fact that the patient's statement is worth very little without the corroboration of an observer. The American workers, during the course of an investigation into sleep conducted at the Mellon Institute, Pittsburg, have invented an ingenious device to record the movements of healthy people in bed. A pen is attached to a part of the bed which yields to the sleeper's movements when he changes the position of a limb or of the body. The pen writes on a strip of moving paper, which also records the passage of time, and each jag in the line represents a movement. A study of 112 healthy people and 70 patients in hospital, and in addition of some children and university men, has shown that the average healthy sleeper changes his position between 20 and 45 times in a typical night of eight hours, and holds about half the positions he takes up for less that five minutes. He does not lie still for an hour at a time once in the night. "Log-like" slumber was only produced by heavy doses of opiates. An extension of the recording device included a cinematograph camera which automatically took the position of the sleeper each time he stirred and ceased to stir. The paper is illustrated with 33 sketches showing the corresponding number of different positions taken up by a typical sleeper, together with a clock showing the times at which he moves. If the bed is comfortable for all positions the sleeper turns through about a dozen gross positions with minor variations in a fairly regular sequence throughout the night. Those that are maintained for fairly long periods are invariably contorted; the spine is always curved laterally and usually bowed backwards and twisted. Even when he lies on his back he does not lie flat, but places one leg in such a way

[1] Johnson, H. M., Swan, T. H., and Weigand, G. E.: Jour. Amer. Med. Soc. Assoc., 1930, xciv., 2058.

as to prevent rotation and throw more of the weight on to the other side. The posture that requires least effort to maintain is a prone one.

The conclusion is that any healthy sleeper would have to be strapped in a frame or moulded in a cast if he were to spend the entire night in the position recommended by any one physician; on the other hand, he contrives to please all of them at some time or another. Just as the best diet for a healthy person is to eat what he likes, so the best posture for healthy sleep is a series of changes as dictated by nature. No one of the positions adopted gives the "complete relaxation" shown in a fainting person, but each relieves the irritation and corrects the errors of the previous position and of the day's activities.

TRANSMISSION OF MATERNAL IMMUNITY.

CHICKENS in the egg and new-born rabbits have very little power of producing antibodies in response to stimulation by a foreign antigen, and it may be assumed that the fœtus in utero is in at least as disadvantageous a position. In man and other animals (monkeys and rodents), in which the placenta is permeable to antibodies, the young one comes into the world already charged with the products of its mother's antibody responses, and is in a good state to resist the attacks of microbes which immediately are made upon it. New-born babies give a negative Schick test—i.e., have diphtheria antitoxin in their blood—about as frequently as adults; about three-quarters of them are protected against diphtheria. As time goes on this dose of maternal antitoxin wears off, and at a year old only about one-quarter of the children will be found Schick negative, and they have to set to work to learn to produce their own antitoxin as they come in personal contact with the diphtheria bacillus. The protection of new-born children against diphtheria or tetanus would be more complete than it is if their mothers were immunised with toxoid during pregnancy, which would not be an unreasonable thing to do. But in other animals, and notably in ruminants, the placenta is thicker and does not allow antibodies to pass from mother to fœtus; the young reach the world entirely without protection, and this may have most disastrous results, as in the "lamb dysentery," which sometimes kills a third of the produce of a flock. Theobald Smith showed some time ago that calves reached the world in this unprotected state and that if they were denied all access to their mother were very likely to perish from a general infection with *Bacillus coli* from their intestines. He found further that they were protected if they sucked their mothers' milk, or if they were given by hand a dose of her colostrum or indeed a dose of her blood. Maternal immunity in the cow is, therefore, transmitted through the colostrum and not across the placenta. The brilliant work of Mr. T. Dalling and his co-workers at the Wellcome Laboratories at Beckenham, the latest phase of which is described in the current number of the *Journal of Pathology and Bacteriology* (vol. xxxiii., p. 783), shows that the same holds for the sheep. Lamb dysentery, as they have shown, is due to a bacillus closely allied to, but apparently not identical with, Welch's bacillus of gas gangrene. It may be prevented by dosing each lamb as it is born with the appropriate antitoxin from an immunised horse, but as may be imagined this is not a convenient or even a practicable thing to do under the conditions which prevail at lambing time in the north of England and south of Scotland, where the disease is particularly prevalent. Equally good results are obtained more easily by immunising the ewes with toxin-antitoxin mixtures at leisure during pregnancy. It is now shown conclusively that the maternal antitoxin passes to the lamb via the colostrum, in which antitoxin reaches a higher concentration than in the ewe's blood for a few days after delivery. It is well-known that antitoxin given by the mouth is ordinarily useless, and that it is destroyed in the processes of digestion. But this, remarkably enough, does not apply to the lamb for about the first three days of its life; during that time horse antitoxin given by the mouth is absorbed and can be demonstrated in the blood; from about the fourth day onwards the alimentary tract is impermeable. Other experiments show that the new-born puppy and foal have the same convenient capacity of absorbing antitoxin given by mouth; the new-born baby seems to have it only to a trivial degree. The whole is an excellent illustration of the predominance of ends over means in determining the behaviour of animals. One way or another all species reach the same end, and the new-born young is furnished with maternal antibodies; animals with thin placentas put it in during pregnancy, those with thick placentas through the colostrum immediately after birth.

THE VITALITY OF ENAMEL.

ABOUT two years ago Sprawson and Bury[1] reported that analyses of human enamel revealed a constant though small amount of organic matter. The delicate methods employed made it certain that enamel is not entirely inorganic and the earlier work of Sir Charles Tomes was thus confirmed. Whether enamel is a vital tissue which can undergo constructive change after eruption is a question much debated. One school holds that it is within the pale of nutrition and thus subject to metabolism in the same way as bone. The other denies the possibility of any alteration after it has once been formed. Most of the evidence for and against these views has been based on histological and staining appearances, but clearly the first necessity was for analysis by methods chemically beyond reproach. Hence the significance of Sprawson and Bury's observations, and Mr. Sprawson has now followed them up by studying the microscopic structure of marsupial and human enamel.[2] He finds that enamel can readily be penetrated by stains from the pulp cavity; the stain does not extend through the whole thickness of the enamel but for a distance depending largely on the age of the tooth. Since the stain can only reach the enamel via the dentinal tubes, which are definitely known to contain protoplasm, it seems a reasonable inference that its passage into enamel depends also on spaces which are not artefacts but part of the normal structure, and, like the spaces in dentine, filled during life with lymph. The tubes in marsupial enamel lie between the enamel prisms, as previously shown by Mummery and von Ebner. Sprawson finds that the patency of the tubes varies with age and that they are more permeable in young animals. As age advances the enamel becomes more highly calcified, by deposition of calcium salts in the interprismatic spaces. This reaction implies nutritional processes in the enamel, since only in this way could the density of the tissue increase. Similar staining reactions

[1] Sprawson, E., and Bury, F. W.: Proc. Roy. Soc., B., 1928 cii., 419; see THE LANCET, 1928, ii., 610.

[2] Proc. Roy. Soc., B., 1930, cvi.

have been noted by others, but under conditions which did not entirely preclude the penetration of stain through cracks artificially produced. But the regularity of the phenomena now described by Sprawson and the large number of teeth examined seem to leave little doubt that enamel is a vital tissue in which an exchange of calcium salts takes place. He shows incidentally that cracks in the enamel are common and are probably due to the trauma of mastication. When these cracks occur the enamel and dentine in the vicinity react; the dentine tubes and the interprismatic spaces in the enamel first enlarge and then become hypercalcified. Thus a crack which is at first a definite solution of continuity may be so completely healed as to leave only a linear scar.

Although Mr. Sprawson's paper is primarily a study of marsupial enamel, he reproduces five sections which leave little doubt that the observations apply also to human enamel. He marshalls his arguments with exemplary caution, and the illustrative photomicrographs are beautiful.

VEGETARIANISM AND BLOOD PRESSURE.

THE relation between dietetic habits and raised blood pressure is not likely to be a simple one of cause and effect, though excess of food of animal origin, and especially of meat, is often held to favour hyperpiesis. Enough records seem to have been made of men who, on the one hand, have eaten a great deal of such foods without developing any rise in blood pressure and, on the other hand, of men who have high blood pressures in spite of abstemiousness in this respect, to make it certain that other factors play a determining part. It might still be true, nevertheless, that meat-eating in conjunction with other factors makes a person relatively liable to increased blood pressure, and this is the thesis suggested by Dr. Felix Saile [1] as the result of a series of observations carried out during the past two years. He chose for his subject 110 monks belonging to the Trappist, Carmelite, and Carthusian orders, whose rules forbid the use of meat, fish, eggs, and butter, and as controls he employed 115 monks from the Dominican and Franciscan orders, who are permitted to eat meat four and five times a week respectively. The mean blood pressure of the vegetarians was considerably lower than that of the controls at all ages from 20 to 90. The difference was greatest in the age-group 60 to 70, where the mean for the vegetarians was 120 mm. Hg, and for the meat eaters 160 mm. Hg. Interesting as such observations are, they cannot be considered conclusive, a fact which is recognised by Saile himself. The general rules of life differ widely in the two sets of orders. The Trappists, Carmelites, and Carthusians are under a vow of silence, and live secluded lives devoted largely to manual work, or to study and contemplation, as the case may be. The Benedictines and Franciscans, on the other hand, come into closer contact with one another and with the outside world, and live what ordinary folk would consider a much more normal life. It remains yet to be proved, therefore, that the diet of the two groups of orders was the primary factor determining the difference in the average height of their blood pressure.

[1] Med. Klin., Nr. 25, June 20th, 1930.

TUBERCLE BACILLI IN THE BLOOD.

THE final positive diagnosis of tuberculosis rests almost entirely upon bacteriological evidence, and accordingly it has become the practice to examine any or all of the excretions in the hopes of finding the organism. According to R. Russew,[1] examination of the blood itself with this object was first carried out successfully by Villemin, and since his original observation it has been generally accepted that bacilli can be recovered in cases of severe miliary tubercle. In the type of disease for which Landouzy coined the word "typhobacillose" it is likewise supposed that tubercle bacilli are swarming in the blood stream, but here the infection is too massive and virulent to permit of tubercle formation and a true bacillæmia leads to death. The conception of tubercle bacilli in the blood in these acute cases is readily acceptable, and of greater interest are Russew's results in much less acute cases and in so-called surgical tuberculosis. The method he employs is that devised by Prof. Löwenstein, in whose clinic in Vienna the work has been done, and it is to strict attention to detail that he attributes his success. Tubercle bacilli were discovered in the blood of six out of seventeen patients with pulmonary tuberculosis and some of the positive results were cases where the temperature was normal or subfebrile. The association of bacillæmia with a good general state is strikingly demonstrated in the cases of surgical tuberculosis. Here, in a group of eight patients, six had tubercle bacilli in the blood and yet were free from fever and in a good general state of health. Russew's work suggests that tubercle bacilli are recoverable from the blood more often than is generally recognised and that this bacillæmia does not necessarily mean a fatal prognosis. If surgical tuberculosis is accompanied by bacillæmia the possible excretion of tubercle bacilli by such patients has to be considered, and this has an important bearing on their infectivity. Another deduction would be that in cases of long-continued pyrexia of unknown origin a blood culture should be done by Löwenstein's method.

HYPOGLYCÆMIA AND SUPRARENAL TUMOUR.

CLINICIANS are now familiar with the distinctive train of symptoms which is provoked by an overdose of insulin. The analogy offered by other endocrine glands suggested the possible existence of a condition of spontaneous hypoglycæmia and led to the discovery of the rare condition now known as hyperinsulinism, the pathological basis of which is hyperplasia of the islet cells of the pancreas. Hypoglycæmia of lesser degree has been observed in other conditions such as Addison's disease and acute necrosis of the liver. Again, the hunger, intense muscular weakness, and tremor which often follow prolonged muscular exercise in a fasting subject, are symptoms suggestive of hypoglycæmia and are quickly relieved by sugar. Certain cases of adiposity associated with excessive craving for sweet food are also capable of the same explanation.

H. B. Anderson[2] records a case of hypoglycæmia associated with a tumour of the suprarenal body.

The patient was a man of 33, admitted to hospital in a state of coma, from which he could with difficulty be roused. He was very restless and perspired freely.

After intravenous injection of 60 grammes of glucose he quickly regained consciousness. On leaving hospital he remained well except for attacks of uncontrollable temper.

[1] Wien. Archiv f. Inn. Med., 1930, xx., 231.
[2] Amer. Jour. Med. Sci., July, 1930, p. 71.

Later he was readmitted in coma and could not be revived by glucose. His blood-sugar varied between 0·04 per cent. and 0·08 per cent. Post mortem an encapsulated tumour, apparently a cortical carcinoma, replaced the left suprarenal and the right suprarenal was smaller than usual. The pancreas was normal, apart from some vascular congestion towards the tail.

It is clear that hypoglycæmia played a large part in causing the symptoms in this case. Hypoglycæmia is not surprising in a lesion of the suprarenal capsule in view of the opposite effects exerted on the blood-sugar by insulin and adrenalin. It cannot, however, explain the patient's death, for although it was recognised early intravenous injection of glucose failed to save the patient. Evidently some more important factor, probably destruction of the cortical suprarenal tissue, which is known to be essential to life, was concerned.

CYCLICAL VOMITING.

BIOCHEMICAL research has thrown much light on periodic attacks of sickness in childhood, and the associated "acidosis" has been widely studied. The condition is fairly well defined. The attacks may begin early, usually in nervous children, and sometimes recur with remarkable regularity, the child being apparently well in the intervals. The onset may be sudden, but is often preceded by a day or two's malaise, irritability, and, commonly, constipation; during this time acetone bodies may be detected in the urine. Vomiting is at first severe; it may persist for hours or days, and be associated with profound collapse, but recovery is rapid, and death in an attack is almost unknown. Many attempts have been made to account for the periodic nature of the disorder, and the good health of the patients between the attacks. Some observers regard the vomiting as a form of childish biliousness, allied to the "bilious attacks" or migraine of adults, and there is no doubt that such children not infrequently develop typical migraine in later life, while a hereditary factor unquestionably plays a part in both conditions. Others look on cyclical vomiting as merely a general reaction to a simple gastro-intestinal "upset"; but although dietetic errors and constipation can often be found before an attack, it is hard to believe that these can be wholly responsible. A third body of opinion regards the condition as an allergic reaction, comparable in ætiology to asthma and hay-fever, and due to protein sensitisation; whilst some look upon it as a form of juvenile "hysteria." The view most widely held, however, is that the condition is essentially metabolic in origin, and there is much to support this theory. The constant presence of ketone bodies in the urine points to disordered metabolism both of fat and carbohydrate. The ketosis may be intense, and is almost always associated with some degree of hypoglycæmia. During an attack the blood-sugar has been found as low as 37 mg. per cent., and amounts of oxybutyric acid as high as 5 g. a day have been noted in the urine. Often there is a greatly increased excretion of urea, and sometimes there are large numbers of casts, comparable to those found in the acidosis of diabetic coma. Little exact information is available about the condition of blood apart from its sugar content, but no marked changes have been found in the reaction, or in the percentage of creatinine or fat. There are also few reports on the frequency of intestinal intoxication, and the output of such substances as indican in the urine during the attacks. A reduction of blood-sugar appears, however, to be almost constant, and H. C. Cameron and others have been led from this to lay much emphasis on the hypoglycæmia of the "nervous child." It is clearly important, therefore, to determine if possible how far the subject of cyclical vomiting is abnormal between attacks, and in his response to stimuli that may be expected to call them forth. Among these stimuli may be mentioned dietetic errors—especially an excess of fat or sudden limitation of carbohydrate—severe physical exertion, and emotional influences. L. Salomonsen, of Oslo, reports [1] that he has examined a number of normal children with this object, and his results are interesting. In 15 healthy infants between 1 and 4 years old, subjected to complete starvation for 48 hours, the blood-sugar fell to between 31 and 70 mg. per cent., whilst the blood acetone and blood fatty acid values rose considerably; in 9 a large number of casts appeared in the urine. In 12 healthy children, aged 5 to 14 years, a sudden change to an excess of fat in the diet led to symptoms closely resembling those of cyclical vomiting, but of very variable intensity, which reached a maximum after two to five days of the high fat diet. Chance febrile attacks during such "alimentary acidosis" in healthy children greatly increased the ketonuria. Six children who suffered from cyclical vomiting showed no difference, in response to precisely similar changes in diet, from those seen in the normal children. There was thus no indication that such children are in any metabolic respect different from healthy children, and Salomonsen concludes that there is no evidence that cyclical vomiting is a "metabolic disorder." It is, he thinks, an entirely physiological response, exactly analogous to what can be artificially produced in healthy children by sudden restriction of carbohydrate. The precise cause which leads to the onset of an attack he leaves undecided.

USE OF THE LEFT HAND.

A hundred and fifty years ago Benjamin Franklin published "The Petition of the Left Hand," urging the use of that neglected member to aid and relieve its fellow. Since then we have learnt a great deal about the treatment of left-handed children, who are no longer scolded into neurosis for using the hand which comes natural to them. The majority who are right-handed, however, seldom do anything to encourage the use of the left hand, and in the French Academy of Medicine on July 8th Dr. Armaingaud appealed for a wider recognition of the value of ambi-dexterity.[2] The experience of men who lost their right hands in war service has shown how successfully the left hand can be trained, and the advantage of being able to use either hand as occasion demands is obvious. Dr. Armaingaud mentioned the value of ambidexterity to surgeons, and senior members of the Ophthalmological Society will recall the way in which Critchett could remove the lens of the right eye with the right hand and the lens of the left eye with the left hand at a single operation. Dr. Armaingaud frankly characterised right-handedness as an "invalidité artificielle," and he so far impressed the members of the Academy that the subject was referred to a committee for consideration.

WE regret to announce the death at Torquay, in his eighty-eighth year, of Dr. Thomas Outterson Wood, well known in connexion with psychiatric work. We hope to publish an account of his long and valuable career.

[1] Acta Pædiatrica, 1929, ix., Suppl. 1.
[2] Bull de l'Acad. de Méd., 1930, civ., 48.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCIII.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.*

PART I.

PULMONARY tuberculosis, as seen in the adult, is rarely a primary infection; it is a reinfection. The body has already acquired a degree of immunity which means that the organisms find themselves in an environment, in a measure prepared to resist them. In those cases in which the primary invasion has produced but a low grade of immunity, and, at the reinfection, large quantities of tubercle bacilli are disseminated in the lungs, there is rapid spread of the disease, which is extremely difficult or impossible to control. On the other hand, the resistance may be completely effective, or it may be partially so only, and, as a result, one finds in the lung caseation, fibrosis, and cavitation. Here we are chiefly concerned with :—

(*a*) The cases in which the resistance of the individual, even when fostered and assisted by sanatorium treatment and hygiene directed to the improvement of the general health, fails to prove efficient. This may be because the tubercle bacilli have had too long a start, or because their relative potency to the resistance is too strong, or the individual's resistance is not overcoming the tubercle bacilli sufficiently fast, the time factor being of importance.

(*b*) The cases of chronic or fibroid phthisis, in which the pathological fibroid tissue which has formed, while beneficial in checking the too rapid advance of the tubercle bacilli, becomes in turn detrimental to the lungs. This fibroid tissue is continually shrinking and so diminishing the volume of the lung. Some compensation is possible by the falling in of the chest wall, the displacement of the mediastinum, and the compensatory emphysema of the healthier parts of the lungs. This, however, does not prevent the deleterious influence of the fibrosis on the bronchi and bronchioles, which gradually become dilated and hypertrophied, so that a condition of secondary bronchiectasis with retention of secretions and toxæmia develops.

(*c*) Cases with cavities too large, or with walls too well defined to heal under medical treatment. These cavities, in addition to being responsible for continued toxæmia, are dangerous as potential sources of severe hæmoptysis.

(*d*) Cases of serious, long and continued or recurring hæmorrhages, whether they come in the previous category or not.

Surgery, in the treatment of pulmonary tuberculosis, is not the performance of a radical operation producing a cure, and needing but the healing of the wound and convalescence. It is an adjunct to medical treatment, aimed to overcome those obstacles which are causing sanatorium treatment alone to fail, and designed to readjust the anatomical, physiological and pathological intrathoracic balance, so that sanatorium treatment can play its part without an overwhelming antagonistic handicap.

The objects of surgery are to rest the lung, to remove the tension and distortion strain of the pathological fibrous tissue formation, to abolish abnormal cavities whether in the lung parenchyma, due to dilatation of the bronchi, or in the pleural cavity; finally, to prevent the recurrence of hæmorrhages. All these objects are obtained by one means only—the collapse of the lung; it is the manner of procuring this collapse that differs according to the circumstances of the case.

* The substance of this article was communicated to the Congress of the Royal Institute of Public Health held in Portsmouth in June, 1930. Part II. will appear next week.

The surgical methods available for obtaining these ends are artificial pneumothorax, oleothorax, phrenic evulsion, extrapleural pneumolysis, thoracoplasty, and multiple neurectomy. Some of these collapse, to a great or less extent, the whole lung, others are entirely or mainly local in their action.

Artificial Pneumothorax.

The lung is separated from the chest wall by the pleural sac in which there is normally a negative pressure equal to about 6 mm. of Hg. If this pleural sac is filled with air until the intra- and extra-pleural pressures are both at atmospheric pressure or zero the normal lung will collapse completely by virtue of its elasticity. This is the result aimed at when an artificial pneumothorax is done for disease. Its realisation, however, often fails. One reason for failure is that a lung extensively fibrosed, or with thick walled cavities, or containing areas of consolidation is incapable of such complete collapse, even if the intrapleural pressure is raised above zero. An excessively mobile mediastinum may be another cause for failure in that, even before the intrapleural pressure is zero the mediastinum becomes displaced to the opposite side and, pressing on that lung, embarrasses its ventilation and the oxygenation of the blood. This can sometimes be checked by the introduction of gomenol oil. A far more frequent and serious difficulty in the production of a successful pneumothorax is the presence of adhesions between the two layers of the pleural membranes. These, holding out the lung, prevent a collapse sufficient to be of any value in 40 per cent. of the cases attempted, and interfere with complete or reasonably complete collapse in 20 per cent.

Artificial pneumothorax, when it produces complete or almost complete collapse of the lung, either without the necessity of dividing adhesions or after the division of these, is one of the most successful methods of treatment for pulmonary tuberculosis. In most of these cases the benefit becomes almost immediately apparent by the reduction in temperature, the improvement in the pulse-rate, the diminution of cough and sputum, and the lessening of dyspnœa. The reduction in the toxæmia is responsible for great benefit in the general condition and a gain in weight. In the very earliest stages there is often increase of cough and sputum and loss of weight, but these are temporary only.

The results of Matson, Matson and Bisaillon in 600 cases were as follows :—

—	Cases	Clinically well.	Arrested.	Dead.
		Per cent.		
Satisfactory compression	235	48·5	18·7	22·0
Partial compression	245	11·4	11·8	58·0
No free pleural space	120	5·8	9·2	66·6

CONTRA-INDICATIONS.

The contra-indications to artificial pneumothorax treatment, apart from failing heart, nephritis and extensive tuberculous enteritis, are based on the anatomical extent of the disease in the opposite lung. If there is only slight root involvement, not interfering too greatly with air entry, or a localised lesion of a lobe, it is justifiable to attempt a complete pneumothorax on the more affected side. If the better lung

has, however, more extensive disease than that just indicated, it is wiser to aim at a partial pneumothorax. Under these circumstances it is particularly advantageous if a "selective collapse" can be obtained—i.e., collapse more or less localised to that area chiefly affected by disease. In certain cases with simultaneous bilateral active disease it may be necessary to establish a bilateral pneumothorax, that on the less involved side being started as soon as the first is satisfactorily established. Bilateral pneumothorax is also done in cases in which, the one lung being under control, the disease later spreads in the other. In either case the pneumothorax is, of course, partial only, and great care is required so to control the total collapse that too great a strain is not placed on the heart.

It may be as well here to emphasise once again the importance of the correlation of sanatorium with surgical treatment. In the initial stages of pneumothorax rest in bed is essential. Until the temperature has settled down, until the pulse-rate has steadied and the patient's general condition has improved, exercise is strongly contra-indicated. Further, constant X ray control is essential. There is the danger of excessive mediastinal displacement and of hernia of the pleura; there is the still greater danger of tearing open thin-walled cavities when partially held out by adhesions; there is the frequent complication of pleural effusions which necessitate alterations in the routine of the refills of gas; there are the difficulties associated with the lung that refuses to stay collapsed, and creeping out despite refills, becomes progressively adherent.

ADHESIONS.

The serious import of adhesions is clearly shown by the results. With a complete pneumothorax 48·5 per cent. of the patients heal and can return to and carry on with their work; but with a pneumothorax in which the collapse is interfered with in whole or in part by adhesions, only 9·3 per cent. are so restored to health. The finest adhesions will often rupture, especially during a fit of coughing when the intrapleural pressure is considerably raised. Moderately fine adhesions will stretch, and may in time yield sufficiently to allow efficient collapse of the lung. It is the broader string-bands and the veils which are the trouble. Some of these contain vessels of considerable relative size; others are fibrous in their peripheral part only, whilst the central part consist of a cone-shaped, drawn out part of the lung. It is obvious, therefore, that the division of these, unless special precautions are taken, is accompanied by the risk of hæmorrhage from the vessels or of the escape of blood and air from the divided part of the lung, and later of infection also.

The invention of the thoracoscope which enables one to see in the pleural cavity led naturally to the thermocautery for the division of these bands. The latest advance has been the use of diathermy, which coagulates the adhesion and diminishes still further the risk of hæmorrhage from the vessels when dividing the adhesion. Hitherto the thoracoscope has been introduced through one cannula and the cautery through another. Quite recently F. G. Chandler has brought out a thoracoscope of small calibre which combines the means for applying a diathermy current and of cauterising the adhesion. It is a most ingenious and practical instrument, and enables one to tackle with confidence quite large adhesions and broad bands.

COMPLICATIONS.

The commonest of all the complications of artificial pneumothorax is pleural effusion. It is said to occur sooner or later in from 30 to 50 per cent. of all cases. It may be transient, being rapidly absorbed, and in such cases it is usually beneficial, as it may lead to a less rapid absorption of the gas. More often an effusion, once it has started, tends to become chronic. The effusion may be sterile or loaded with tubercle bacilli. At first the effusion is clear, with a small cellular content; after repeated aspiration it becomes richer in cells and fibrin, to such a degree at times that it is very difficult to aspirate. The onset of an effusion is generally associated with increase of pyrexia, and sometimes interference with the fluid leads to greater rises of temperature. An effusion may on the one hand cause increase of intrapleural pressure which is deleterious; on the other hand, it may cause the lung to become adherent and to re-expand. In long-standing cases there is always the danger of secondary infection. An effusion causing symptoms of distress from too high a positive pressure must be aspirated and replaced with air; it is unwise, however, to remove the whole of the liquid. If the liquid contains tubercle bacilli, it may be possible in the earlier, more acute stages to sterilise it by injecting methylene-blue in absolute alcohol. Later the effusion should be replaced with olive oil and gomenol. If the effusion is persistent despite these methods of treatment thoracoplasty may be indicated.

Oleothorax.

The use of oil in the pleural cavity has been practised now sufficiently long to permit of a certain amount of dogmatism as to its indications and its value. The oil used is either olive oil or paraffin, to which has been added 0·5 to 5 per cent. of oil of gomenol. Oleothorax is not an alternative to pneumothorax, though on occasion it may be used as a substitute. An oleothorax must never be attempted in a virgin pleural cavity on account of the reaction likely to be produced. The value of gomenol oil is due to its disinfectant action, to the changes it produces in the pleural membranes, making them more rigid and impermeable, and, on occasion, to its compressing action on the lung. One of the most important indications of gomenol oil is in the treatment of pyo- or pyo-pneumothorax, whether occurring as a complication of artificial pneumothorax or from other causes, when either the pleura is infected with tubercle bacilli alone, or in the treatment of a mixed infection. In these cases also the oil must not be used until the acute stage of the lesion has subsided. In cases of pyopneumothorax complicated by bronchial fistula oleothorax may be successful in obliterating the fistula and clearing up the infection in the cavity. In cases of pneumothorax with hernia of the pleura or with a mobile mediastinum, gomenol oil will prevent the recurrence of the former by causing thickening of the pleural membranes; for the same reason it will cause fixation of the mediastinum. An oleothorax may lead to greater compression of the lung than can be obtained by a pneumothorax; it may also retard the obliteration of a pneumothorax when the lung is becoming progressively adherent. Lastly, in certain cases of artificial pneumothorax, for which the frequent refills of air are difficult to arrange, gomenol oil may be substituted for the air. The thickening of the pleura and the slow rate of absorption enable the intervals between the refills to be prolonged from every two weeks or so to about two months. Olive oil is absorbed more rapidly than paraffin, and is, for this reason, more generally used in the treatment of effusions. When an oleothorax is done to replace a pneumothorax so as to

extend the interval between the refills paraffin gives the better results. The great precaution necessary with either olive oil or paraffin-gomenol is to test the reaction of the pleural membranes to it. A big initial dose may produce an alarming reaction. For this reason 5 or 10 c.cm. should be the maximum amount injected at the start. This can be increased to 30 or 50 c.cm. at the next injection, while subsequent doses can be doubled or trebled according to the absence of pyrexial response.

The simplest method of injecting gomenol oil is by means of a Jubet blood transfusion syringe or with a 30 c.cm. syringe. A short needle should be used with a bore of 1 mm. The oil must be warm. When treating an effusion this must be aspirated before the oil is run in.

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SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN LONDON.

PROCEEDINGS OF THE REPRESENTATIVE BODY.

THE annual Representative Meeting of the British Medical Association opened at Tavistock-square on July 18th, with Dr. C. O. HAWTHORNE in the chair. Dr. W. G. WILLOUGHBY, medical officer of health for Eastbourne, was elected President of the Association for 1931–32.

Expansion of National Health Insurance.

On behalf of the Council, Dr. H. G. DAIN moved a resolution stating that the time is now ripe for the medical profession to ask that the dependents of insured persons should be included under the national health insurance scheme. The attitude of the public towards their medical service was, he said, steadily changing; there was an increasing tendency to consider that medical attention was necessary for minor ailments. While it was desirable that an efficient medical service should be available for everyone, its maintenance must become increasingly costly; the general practitioner stood between the devil of encroachments by the public health centres and clinics, and the deep sea of a whole-time medical service which might suddenly engulf him. It was futile to try to forbid development along one or other of these lines. Under the new Local Government Act local authorities had acquired a wide control of hospitals and certain domiciliary services. Extension of the present service of clinics and welfare centres of various kinds could be made gradually without any sudden outlay, but the inclusion of dependents in the national health insurance scheme would mean the immediate provision of a large sum of money. Left in the hands of the local authorities the clinics would gradually gather in this class of patient completely, leaving the medical profession no say in the matter. In some parts of London a well-patronised public medical service run on a contributory basis afforded an objection to a compulsory insurance scheme, but this appealed only to the thrifty type of patient and was not accepted generally. The time had come for practitioners to choose between an insurance system with a free choice of methods, and a whole time medical service with control by the local authorities.

An amendment to this motion, introduced by Dr. E. WARD (Torquay), to provide that the capitation rate for such dependents should be not less than that paid at present for insured persons was lost, on the ground that it limited any demands for remuneration to that sum. But an interpolated plea from Dr. DAIN that policy should not be mixed with business, and that the financial question should be postponed until later, provoked a robust protest from Mr. E. B. TURNER (Kensington). It had been his happy lot, he said, to avoid panel practice, but observation had led him to the conclusion that it was ludicrously underpaid. This was the fault of the medical profession for accepting the system without first demanding a sound financial basis, and unless remuneration were discussed before Dr. Dain's motion was carried, the same result would occur in this case. Any scheme involving the care of women and children would entail an enormous increase of domiciliary work, and if the service were not to be disgruntled adequate payment was an essential. Mr. Turner threw in a frank reflection on the origin of the fees: obviously they could not come from the employer, or the man of many children would be permanently out of work; the insured person himself was unlikely to be in a position to pay; in fact the scheme meant another sixpence on the income tax, so there was every reason why the capitation rate should be adequate.

Dr. J. S. MANSON (Warrington) proposed an amendment, which was carried, to the effect that the extended service should include adequate safeguards respecting remuneration and terms of service. Dr. DAIN then put the motion in the amended form; it was, however, opposed by Dr. PETER MACDONALD (York), who said that his constituents considered that in their district the community was already fairly well served, that in the event of inclusion of dependents in the scheme the economic condition of the doctor would be worse and the work increased to breaking strain, and that they deprecated any step that would reduce private practice. Dr. H. M. STRATFORD (North Kensington) spoke of the London Public Medical Service, now in action at Paddington and North Kensington, which, he said, was successful enough to make any additional scheme appear unnecessary to practitioners who belonged to it. Dr. H. B. BRACKENBURY recalled to the meeting the major premiss of Dr. Dain's argument. It was not possible to ensure that the present state of affairs would continue. To pass the motion was the only way to avoid the danger of a whole-time medical service, which would undoubtedly be adopted in the course of the next few years unless some alternative plan were offered.

Dr. DAIN, in summing up, said that in many industrial areas there was no private practice among dependents of insured persons; this large body of patients attended clinics and hospitals. Only by their proposed inclusion in the national health insurance scheme could they be brought under the care of the general practitioner. The amended motion was then carried.

Hospitals and Private Practice.

The Council has this year provided a revised hospital policy based on a reconsideration of the entire scheme. The classification of patients has now been made under three headings, free, contributing, and private, thus avoiding the term "tariff patient," which never received unqualified approval. Sir RICHARD LUCE, who introduced the new policy to the meeting, ran over the changes involved in it. Among the special services there had been no alteration beyond the addition of an appendix on the provision of pathological services. The future relations of the voluntary hospitals and the new council hospitals under the control of the local authorities must be considered closely. The profession could not stand aside from council hospitals, but the terms on which the work should be undertaken were still to be decided. In the past the profession had always expressed a preference for the voluntary system, but there appeared to be some weakening from this view; some doctors held that the time for the voluntary hospitals was past and that their efficiency was declining, but there could be no doubt that a large number were still in favour of the system and held to it as an article of faith.

The provision of hospital beds where general practitioners could treat their own patients had been the subject of a resolution by the Panel Conference in 1928. To ascertain the practicability of such a scheme a questionaire had been sent out to 830 hospitals, of which 648 had replied. An analysis of the answers showed that none of the London or provincial general teaching hospitals had a local medical staff; that only two out of 109 of the larger general non-teaching hospitals had such a staff, and less than half of the general hospitals with under 100 beds. Opportunities for treatment of private patients in special wards were almost entirely confined to hospitals with less than 100 beds, so that there was little scope for the admission of general practitioners at present. There was no reason why they should not be given more opportunities in those hospitals which provided special wards and annexes, and it was believed that still more scope could be offered in the smaller hospitals—those with less than 100 beds. The new council hospitals would provide a fresh opening; it might be possible to obtain special accommodation for private patients and to treat others in the wards. If this were to be done the principle must be formulated now and admitted by the local authorities, or the opportunity would be passed over without forming any basis for future action.

Remuneration for members of the profession on hospital staffs was still in abeyance. Medical men were diffident about demanding payment where a hospital was in financial difficulties. Obviously, it would be much more satisfactory if the pressure came from some external body; the establishment of a precedent was the first step, and in two centres in the north this had been recognised. Speaking of the new policy as a whole, Sir RICHARD said it was simple, and lent itself to adaptation. It contained, he believed, no change of principle which would be unpleasing to the profession.

THE "COUNCIL" STIGMA.

A lively debate was introduced by Dr. M. W. RENTON (Dartford) over the hypothetical effect on the lay public of the term "council" as applied to hospitals. The ghost of Mother Poor-law, it seemed, had still power to cast her shadow over the future, and minds made sensitive by life in council houses and education at council schools might rebel against the ægis of the council in sickness at least, if not in health. But hardier opinions prevailed, and it was felt that the Briton would not be deterred by a mere generic term from attending a hospital which would doubtless boast a local name as well.

PLACE OF PRACTITIONER IN COUNCIL.

Dr. E. R. FOTHERGILL (Brighton) introduced an amendment suggesting an alternative scheme to be added to that proposed in the policy for the staffing of council hospitals. The policy provided for a full-time medical superintendent, a senior resident staff, a junior resident staff, a consultant visiting staff, and clinical assistants appointed from amongst practitioners of the area. Dr. Fothergill's alternative scheme differed from this only by proposing a whole or part-time medical superintendent, the omission of the senior resident staff, and the addition of a part-time general practitioner visiting staff to have responsible charge of beds and clinics. In small hospitals, Dr. Fothergill pointed out, a full-time medical superintendent might have so little work to do that he would be wasting a large part of his time, and a senior staff of men with the M.D. and M.S. degrees would develop a limited outlook if appointed permanently. A visiting staff of general practitioners would mean the admission of the family doctor to the hospital scheme, from which he had been excluded far too long.

In the discussion which followed the desirability for a senior resident staff, especially in areas where the accident incidence was high, was emphasised by Dr. J. T. D'EWART, and supported by Mr. N. BISHOP HARMAN. The view that the practitioner should be in a position to attend his patient in hospital met with considerable support from Dr. C. E. S. FLEMMING, who spoke of the disheartening and demoralising effects of losing touch with a patient at the most interesting stage of his illness. In many cases the practitioner was perfectly qualified to carry on the treatment if he had facilities at his disposal. By undertaking the post of clinical assistant a practitioner who wished to specialise would have opportunities to follow up the type of case in which he was interested. Mr. E. W. G. MASTERMAN saw an objection, however, to Dr. Fothergill's scheme in that it failed to state who was ultimately responsible for the patient: was it the general practitioner, the medical superintendent, or the consultant? The possibility that the practitioner might be engorging more than he could conveniently swallow was suggested by Mr. H. M. STRATFORD (Kensington). He pointed out that at a previous session the representatives had cheerfully accepted the dependents of the national insurance patients as their inevitable responsibility, and now they were clamouring for the onus of consultant's work at hospitals as well. He thought that Dr. Fothergill's amendment really embraced too much. Sir RICHARD LUCE said that he was quite prepared to accept Dr. Fothergill's amendment. The scheme of staffing proposed by the hospitals' committee would apply to the large municipal hospitals; that suggested by Dr. Fothergill was perfectly applicable to smaller hospitals. But he thought the "medical superintendent" should not be described as "whole or part-time," and that these words should be deleted. Dr. FOTHERGILL accepted this alteration, and his amendment was carried as an alternative scheme to that of the Council.

THE INCOME LIMIT.

Incorporated in a footnote of the hospital policy were the suggestions of the committee for an increase in the income limit in contributory schemes, the highest income not to exceed £350 or £7 a week. Dr. F. H. BODMAN (Bristol) proposed adherence to the old scale with £300 as the highest limit; an increase would result in loss of private practice to many practitioners. Other speakers considered that it would mean an encroachment on the junior consultant's fees as well. Sir ROBERT BOLAM explained that the raised limit was designed to include those foremen and higher workers in industrial areas who would really form the backbone of the scheme. A small difference in wages might be sufficient to put these workers outside the scheme and as they were few in number their inclusion would be no great loss. Mr. W. MCADAM ECCLES held that the effects of trade depression should be considered, those who were making a stout struggle against it should be encouraged by the opportunity to join such a scheme. Trade depression, however, falls alike on the unjust and the just, and Dr. R. M. MANWARING-WHITE was inclined to see its saddest effects on the junior consultant. Dr. N. E. WATERFIELD pointed out that to add to the numbers supporting contributory schemes would be to lessen the contributions to hospitals, since persons belonging to these schemes received special concessions in hospital.

The feeling of the meeting was opposed to an increase in the income limit. Dr. Bodman's views were endorsed by the meeting.

FREE CHOICE OF PRACTITIONER.

Dr. D. F. TODD proposed an amendment from Sunderland, suggesting that:

"Whether in the private rooms or wards of hospitals which have both public and private wards in the same building or in the special accommodation for private patients of a separate home or hospital provided exclusively for such patients, such home or hospital being an annexe of, or associated with a voluntary hospital having public wards, every private paying patient shall have 'free choice' of practitioner as his attendant, and of consultant and/or specialist, and that anything to the contrary in the proposed revised hospital policy shall be deleted."

Sir RICHARD LUCE said this amendment involved an alteration of the old hospital policy rather than the new. The feeling in most hospitals was against letting general practitioners into the general wards, and it had seemed advisable to limit their opportunities to patients treated in a separate annexe. Dr. H. B. BRACKENBURY opposed the motion on the ground of injustice to the consultant. The private wards contained the paying, and the general wards the non-paying patients; it was unfair that the general practitioner should retain control of all those that paid and hand over all those who must be treated for nothing. There was no reason why any hospital which desired to make the change suggested by Sunderland should not do so, and nothing to prevent the general practitioner from having such control of treatment as he and the consultant agreed between them. This part of the scheme, it should be remembered, applied only to those hospitals where private rooms or wards were found in the same building as public wards.

Dr. PETER MACDONALD supported the amendment; in the future it was hoped that members of hospital staffs would receive payment, so that the consultant would no longer be treating patients in the general wards for nothing. His view was shared by Dr. A. B. MURRAY, who felt any other attitude to be contrary to the policy of the Association. Opposition to the amendment was offered by Sir ROBERT BOLAM and Mr. BISHOP HARMAN, both of whom felt there was every necessary safeguard to the general practitioner in the policy as laid down. The paragraph in the policy which provoked discussion ran as follows:—

"When special accommodation for private patients takes the form of private rooms or wards in a hospital which has both public and private wards in the same building then: (*a*) if the hospital has a resident medical officer or officers and also a visiting staff which is ordinarily responsible for the care of all patients in the public wards—the patient should be under the responsible care of a member of the visiting staff, in association with the private practitioner of the patient who should have free access to the patient and should have such share of the responsibility and treatment of the patient as may be agreed upon between the member of the visiting staff and the private practitioner. . . ."

Dr. E. R. FOTHERGILL said that all the arguments used embodied two extremes. In a hospital with a visiting staff it was supposed that the staff assumed the view that all private wards were theirs and the general practitioner should not come into them, while the general practitioner was said to regard the private wards as his, and to demand the choice of consultant. The compromise was for the practitioner to go into the wards, and for the consultant to decide with him the responsibility that each should have in the case.

In replying to objections to the amendment Dr. TODD said that he was thinking chiefly of provincial hospitals where the staffs were often composed of general practitioners, who might even be in panel practice. It was most undesirable that a doctor should have to hand over his patient in hospital to a rival practitioner. Dr. BRACKENBURY asked whether Dr. Todd would be willing for his amendment to apply only to those hospitals where the staffs were composed of general practitioners. Dr. TODD agreed to the suggestion, but Dr. HAWTHORNE from the chair pointed out the pitfalls which awaited those who would draw a dividing line between general practitioner and consultant; on his proposal the amendment and the debated paragraph of the policy were referred back to the Council for further deliberation.

HOSPITAL RECORDS.

Another amendment moved by Dr. TODD, for Sunderland, referred to a short paragraph on the confidential nature of hospital records, and demanded the deletion of a phrase at the end reading "and access to them allowed solely to members of the visiting staff of the hospital." It was clear from the outset that what Dr. Todd, and indeed the meeting as a whole, wished to establish was that the general practitioner should also have free access to the records, while unauthorised persons should not. An interlude followed in which the meeting struggled for words to express this simple thought. After a complicated and painful labour the amendment was reborn and accepted in the following form: "These are confidential documents and access to them should only be allowed by the medical practitioner or practitioners responsible for the care of the patient."

OTHER AMENDMENTS.

Dr. F. RADCLIFFE, for Oldham, objected to certain paragraphs in the policy which estimated the number of panel patients treated at hospitals at 80–85 per cent., of indigent poor at 15 per cent., and of private patients or persons above the income limit at 5 per cent. He moved the deletion of these figures as being inaccurate in parts of the country other than that for which they were calculated. He deprecated

the inclusion in the scheme of figures which could be challenged and overset. Sir ROBERT BOLAM explained that the figures were carefully qualified by the context and were designed to give persons outside the profession some idea of the magnitude of the question. For the country as a whole the figures were not inaccurate, though they doubtless failed to cover the facts in certain industrial areas. The meeting decided that the paragraphs should be retained unaltered.

Dr. H. MACWILLIAM introduced an amendment not on the agenda referring to a paragraph in the Council's policy for hospitals with 100 or more beds. This read: "The visiting staff should be of a recognised competency, and should be proportionate to the number of beds in the hospital; a suitable ratio is about 1 to every 25 beds, or where out-patient departments exist the ratio of the staff should be greater." Dr. MACWILLIAM said that in a hospital of 1500 beds such a small number as 25 would be unreasonable, while if there were many chronic cases the consultant would have very little work. Dr. R. K. FORD (Preston) pointed out that the whole of this section, dealing with the standards for hospitals with 100 or more beds, was not applicable to the Council hospitals as drafted. The meeting therefore referred back this part of the policy to the Council for reconsideration.

Two amendments to postpone any decision on the policy until next year were defeated, and the hospital policy as amended was put to the meeting for approval and was accepted.

A General Medical Service.

Dr. J. W. BONE, who introduced this subject, was careful to point out that no scheme had as yet been formulated for a general medical service. All the Council wished to submit was a series of proposals which might form the basis of such a scheme. There had been a constant demand from the country of late years for health services supplied by the State and each of the political parties had had plans for adding to these services. It was necessary for the Association to be ready with proposals which voiced the opinion of the medical profession if coöperation became desirable. The proposals had their origin in a request from the Representative Body two years' previously that the Council should inquire into the increasing encroachments of one sort or another on medical practice. After hearing the report the Representative Body advised the Council to produce constructive proposals, and these were now set forth. The Ministry of Health had had no hand in their production, which was the work of seven consultants, five medical officers of health, and twelve general practitioners.

The persons included in such a scheme must be all the members of the community for certain services not obtainable otherwise, but a proportion of them would, of course, pay for such services. A second group, comprising the dependents of insured persons, would cover their service, either domiciliary or institutional, on some insurance plan. Finally, there were the indigent for whom the cost must be borne by the community. Both the family doctor and the consultant services would be provided on a contributory basis; institutional treatment would at present depend on the voluntary and council hospitals—the old poor-law institutions—since no other services were available. The financial aspect of the scheme had not yet been considered, because if the proposals were accepted that would require the attention of a different body. These proposals were merely a contribution to any national discussion on the subject in the future, and it was for the meeting to decide on the cardinal principles and help to set them out.

Dr. J. W. E. CORY (West Suffolk) suggested that the scheme would never have been formulated except under the threat of a whole-time medical service by the State, and that therefore the assertion in the Council's proposals "that it is in accordance with the beliefs and traditions of the medical profession" should be replaced by a declaration that the scheme was advanced only as a preferable alternative to a State medical service.

This frank proposal provoked much opposition; Dr. H. M. STRATFORD pointed out that the idea of a State medical service was at present only a bogy, and Dr. BRACKENBURY reminded the meeting that this was not the submission of a scheme requiring acceptance but an opportunity for discussion of principles which might ultimately have administrative effects. It was unwise to adopt an unconciliatory attitude at the outset. Dr. H. W. POOLER hoped that no statement would be allowed to go forward which implied that the medical profession was afraid of anything; least of all of a State medical service. In face of this opposition Dr. CORY's amendment perished.

Dr. A. B. MURRAY (Banff, Moray, and Nairn) proposed the alteration of the principle given in the proposals: "That the interposition of any third party between the doctor and the patient, so far as actual medical attendance is concerned, shall be as limited as possible," to: "That there shall be no interposition of any third party between the doctor and the patient so far as actual medical attendance is concerned." Dr. BONE spoke of several uncomfortable situations in which such interference was inevitable—for example, excessive prescribing or in malpraxis. The meeting rejected the amendment, and was addressed again by Dr. MURRAY on a different plea. He proposed that in any arrangements made for a communal or subsidised or insurance medical service the medical profession should be represented on the bodies responsible for the administrative and financial control of that service. The Council's proposals had required only free consultation with the medical profession by these bodies, but Dr. MURRAY suggested that this was inadequate. Dr. BRACKENBURY remarked that the two bodies in question appeared to be the Treasury and the Ministry of Health, on neither of which the profession could claim representation. The county councils or county borough councils were scarcely bodies on which a medical representative need sit. This amendment was also lost.

CARE OF THE INDIGENT.

An ingenious plan for the inclusion of indigent persons in the scheme had been provided by Dr. Brackenbury in the proposals, and was as follows:—

> "The cost of the domiciliary medical attendance of what has been known as the pauper class is known, or could easily be ascertained in every area, for, say, the last five years. This divided by the number of persons attended would give an average cost per person for domiciliary attendance. This amount per head could be paid by the Public Assistance Committee into the local national health insurance pool for each person referred by that committee for domiciliary attendance."

Dr. H. C. JONAS (Barnstaple) moved the deletion of this method from the proposals on the grounds that it had been decided not to consider financial questions as yet. The records kept by poor-law officers were not such as to make the method

practicable in any case, and at this stage it was impossible to arrive at any accurate figure.

Dr. BRACKENBURY said that it was difficult to find a method whereby these persons could be included in any scheme, and this had been formulated in reply to the question put by the Royal Commission: "Can you give us an illustration?" At the time no illustration had been forthcoming, but he believed this suggestion to be practicable. The pool, of course, would belong equally to paupers and non-paupers, and capitation fees would be redistributed from it irrespective of the class from which the patient came. Dr. JONAS said in reply that he was entirely in favour of the inclusion of the pauper class, but it was a difficult problem and should not be touched on in a document of this sort. It was decided to delete the passage.

A PROPHECY.

Among the proposals the following statement finds a place: "When all the work done in hospital is paid for, the scale of fees for outside work (which may be expected to diminish under this scheme) will naturally tend to adjust itself to the new circumstances." Dr. L. A. PARRY objected to this as misleading; if the hospital service were extended he said, outside work would be less than ever, and it would be impossible to charge lower fees. Dr. BONE replied that it was the only example of prophecy among the proposals. It was a case of the law of supply and demand; if members of the profession were properly paid for the work they did in hospital they would be in a position to charge less outside. This was one of the paragraphs in the proposals which would appeal to the general public, especially the middle classes. The statement was allowed to stand.

ADMINISTRATIVE DIFFICULTIES AND FINANCE.

Dr. E. R. FOTHERGILL, for Brighton, objected to the proposal that access to the local authorities should be through the medical officer of health, who, he thought, was not necessarily in sympathy with the practitioners of his area. The point introduced an interesting discussion on the relations usually existing between these parties, but the feeling of the meeting was that the local practitioners should have direct access to the county council or other administrative body when they so desired.

Dr. MILBANK-SMITH supported Dr. FOTHERGILL. The Insurance Act, he said, could never have been administered without statutory local medical committees; the scheme under discussion would be even more universal in its action. Under the proposals as they stood the medical officer of health would have to accept great responsibility. The county council would probably meet about four times in the year, and in the intervals he would often have to make decisions without consultation with that body. There should be a statutory medical committee with which he could confer on these points. Such a plan would be much simpler than one by which all small differences of opinion between the medical officer of health and the local practitioners were referred to the Council of the Association.

Dr. MIDDLETON MARTIN agreed that there was much to be said for the point of view adopted by Brighton, but he, as a medical officer of health, had discussed this question with his colleagues and they foresaw many difficulties in administration should Dr. Fothergill's amendment be carried. He thought that too many cooks might spoil the broth if the medical officers of health were forced to refer to a medical committee. The interests of the profession were the concern of the M.O.H., and he looked forward to the amicable coöperation of general practitioners with this officer. A division of opinions placed before the local authorities would complicate administration.

That the proposals of Brighton did not go far enough was the plaint of Dr. D. O. TWINING. Medical officers of health varied in their behaviour to other members of the profession in their area; some were Mussolinis and some were mice. Either variety was capable of reversing his opinions in a disconcerting manner, and one had been known to expect a revised decision to act in retrospect. If administration depended on one man in an area, efficiency depended solely on the character of that man; responsibility of such a kind was too great—it should depend on a local committee.

Dr. CHRISTINE MURRELL epitomised the arguments used in favour of the amendment when she said that though such direct access would probably be seldom needed, it was a useful power. The paragraph in the proposals was altered as suggested.

An estimate of the cost of the scheme had been introduced into a separate section of the proposals, calculated on a basis of figures obtained from the report of the Royal Commission on National Health Insurance in 1926. These figures, which had been included only for the sake of completeness, and to convey some idea of the financial aspect to the general public, were challenged by Dr. J. W. E. CORY on the grounds that they were not only out of date, but sketchy and misleading. A subsequent suggestion that the section might be left in if all the figures were deleted, though it gained the support of Dr. BRACKENBURY, was earnestly opposed by Mr. H. S. SOUTTAR, who protested against the emasculation of the scheme by the removal of a relevant part. The first question of any reasonable man, he said, when faced with these proposals would be: "How much will it cost?" and to put forward the scheme without giving some idea of its expense would be ridiculous. Dr. BONE agreed with him; no one would be satisfied by the mere statement that estimates had been made; he would want to know what they were. The section under discussion was retained unaltered.

Dr. A. S. WILSON proposed for Holland, Lincs., that the head of the local medical arrangements under these proposals should be a practitioner who had had a considerable number of years' experience of private medical practice. His argument was based on the ignorance, in some cases, of general practice by the medical officer of health, who might otherwise become the head of these local arrangements. The meeting, however, was not prepared to proceed to these lengths, and the amendment was lost.

Dr. BONE introduced an amendment to add to one of the principles laid down in the proposals—namely, "that medical benefits of the present National Health Insurance Acts should be extended so as to include the dependents of all persons insured thereunder." He suggested the insertion of the words "entitled to medical benefit" after "persons," since it was not intended to include "voluntary" subscribers who were not entitled to medical benefit. This alteration was approved.

An amendment to delay acceptance of the amended proposals, introduced by Dr. G. B. HILLMAN, was discussed very fully. It was stated that attendance at divisional meetings of the Association is often so poor that it is impossible to be sure that the

proposals have received the consideration of more than a fraction of the profession. For this, however, practitioners had no one but themselves to blame in the opinion of the meeting, since the proposals had been before them since April. The need for an early acceptance was urged by Dr. PETER MACDONALD, who said that the scheme should be available as propaganda as soon as possible, and by Dr. BONE, who thought that medical practitioners would not realise that the scheme had come into practical politics until these proposals were passed. The proposals, as amended, were eventually carried, whereupon Dr. BRACKENBURY introduced a statement to explain the absence of reference to insurance committees in the proposals, the motion being that the Council should be authorised to use the statement in any way which seemed likely to be useful.

The statement was as follows :—

Insurance committees, under that title or in their present form, are not mentioned in these proposals. The reason is that the ultimate aim of the Association is the unification—not merely the coördination—of the administration of all health services, nationally and locally. This, it seems, can only be accomplished by the establishment of a statutory committee (called in the present proposals the "Hospitals and Medical Services Committee") as an essential and integral part of the organisation of the work of county councils and county borough councils which in this way would exercise a general supervision, under regulations made by the Minister of Health, over the insurance medical services, and bring them into intimate relationship with hospital and institutional services provided or supported by the local authority. There is no reason, however, why the personnel of the new statutory committee should not, if after discussion this seems desirable, approximate still further to that of the existing insurance committees by including also appropriate representation of insured persons through approved societies. Meanwhile, in the not improbable event of some such proposals as those now put forward being adopted, not as a whole but piecemeal, it would be appropriate that extensions of the insurance service to the dependants of insured persons or the provision for such persons of a consultant and specialist service should, as an interim measure, be administered by insurance committees as now constituted. In that event the question of the relationship of the new provision for medical advice and treatment with other services provided by the local authority with a view to the promotion of economy and the prevention of reduplication would require careful consideration, and arrangements for the appointment of a chief medical officer in administrative charge of all the health services would be very desirable.

Dr. BRACKENBURY pointed out that this statement changed nothing in the scheme, and was merely designed to reply to the inquiries of insurance committees on their exclusion from the proposals. The committee suggested it would resemble an insurance committee, but the representation on it would be in other proportions.

Dr. H. C. BRISTOWE suggested that all of the statement following "institutional services provided by the local authority" should be deleted as irrelevant. Dr. H. G. DAIN and Dr. MACDONALD opposed this suggestion, and were able to put the advantages of the insurance committees before the meeting, as bodies usually powerfully influenced by the weight of medical opinion. Dr. BRISTOWE was induced to withdraw his amendment, and the original statement was referred back to the Council for consideration.

(To be concluded.)

ROYAL FREE HOSPITAL.—During the past year the total expenditure was £80,545, and the income £73,006; patients and their societies paid £19,346. The bank overdraft exceeded £30,000. Charges in the out-patients' department have been increased (average per attendance, 1*s.* 11½*d.*); in-patients (average daily number, 233) cost £4 8*s.* per week. It was expected that this year bank interest would approximate to £2000. X ray films are now being stored for safety's sake in an external building.

MEDICINE AND THE LAW.

The Coroners Amendment Act: an Interesting Point.

His Honour Judge Hill-Kelly, sitting at Redhill County Court on July 16th, gave judgment in the case (heard last month) in which Dr. David Low Greig, of Caterham, claimed £22 1*s.* for attending a post-mortem examination and giving evidence at an inquest in respect of the deaths of seven persons at Caterham, on Nov. 8th last, from Mr. F. J. Nightingale, of Reigate, the Coroner for East Surrey. When the action was heard, Mr. H. C. Dickens (for Dr. Greig and the Medical Defence Union) explained that the dispute was a friendly one, as a result of which it was hoped to get His Honour's interpretation of Section 23 of the Coroners Amendment Act, 1926. Mr. Milner Holland appeared for Mr. Nightingale and the Surrey County Council.

His Honour recalled that last November a number of persons were killed at Caterham as the result of an accident to an aeroplane. One of those persons was taken to the house of the plaintiff, there dying the same day. Later, defendant sent an officer to the plaintiff requesting him to go to a mortuary and view the bodies of the other six persons involved in the accident, to determine the cause of death in each case, and also to obtain details for purposes of identification. On Nov. 7th plaintiff attended the mortuary and examined the bodies. Defendant then instructed plaintiff to attend the inquest to be held by him on Nov. 8th. Plaintiff attended as instructed, and gave evidence as to the cause of death of each of the six persons whose bodies he had examined at the mortuary, and also as to the cause of death of the person who died at his house. Having done so, plaintiff was bound over to attend at an adjournment of the inquiry. He attended on that day. The inquiry was held by the defendant sitting as coroner, together with a jury. The course which was taken appeared to have been sanctioned by authority—namely, that where more than one person was killed at the same time, and apparently from the same cause, only one jury was sworn, and the inquiry into all the deaths was taken at one and the same time. Evidence had been given to the effect that the inquiry touching the deaths of the seven persons referred to was made at one and the same time. In those circumstances plaintiff claimed the sum of £22 1*s.*, contending that he was entitled to one and a half guineas in respect of each of the dead persons. Defendant contended that plaintiff attended to give evidence at only one inquest and was entitled to only one sum of one and a half guineas—that was to say, three guineas in all (in respect of the post-mortem and the inquest). The question thus raised depended on the proper construction of Section 23 of the Coroners Amendment Act of 1926, dealing with fees payable to a qualified medical practitioner. The section provided that a doctor should be remunerated in three different sets of circumstances—first, for his attendance at an inquiry without a post-mortem examination; secondly, for a post-mortem examination without afterwards attending an inquest; and thirdly, for making a post-mortem and giving evidence. In order to consider the section it was proper to have regard to the whole of it. It provided that a medical practitioner should be entitled to three guineas for making a post-mortem and attending the inquest to give evidence. Remarking that much depended on the reading of the Act on the interpretation of the word "inquest," His Honour

said it was a common practice for coroners to hold inquiries into the deaths of two or more persons at one and the same time, but in his interpretation of the law he thought there were as many inquests as there were dead bodies. The language of the Coroners Act of 1887 and the Amendment Act of 1926 seemed throughout, with one exception, to contemplate in the use of the word "inquest," one inquiry touching the death of one single person. The exception was in respect of two or more persons who die from the same accident and lay in different parishes or areas under different jurisdictions. In that case the Secretary of State might give an order for the removal of one of the bodies from one area to the other for the inquest. What was significant in that section was that the word used was "inquests"—in the plural. Having quoted a case in the King's Bench having a bearing on this interpretation, His Honour said that the result of that interpretation was that plaintiff was entitled to recover from the defendant the amount claimed—£22 1*s*. and he gave judgment for the plaintiff for that amount. It might appear a strange result of the case that a medical practitioner was entitled to so large a sum in respect of one inquiry, but the fact that the circumstances were unusual ought not to affect the interpretation of the Act of Parliament: no question could arise as to its reasonableness.

His Honour, in giving judgment, awarded costs on Scale C, and agreed to a stay of execution for 21 days, it having been intimated that the case may go to appeal.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

OVER 5000 delegates attended the annual meeting of the American Medical Association this year in Detroit. Of these nearly one-third came from the State of Michigan.

SOCIALISATION OF MEDICINE.

The retiring presidential address by Dr. M. L. Harris dealt with problems of medical economics. The organisation of the Public Medical Service Association in England was held up to delegates as a horrible example of "what may be expected to happen to the medical profession when it loses control of its own business." Similar interference is found in Belgium and in Prussia. "Medicine is being besieged on every hand by forces that are constantly growing stronger and stronger." As a remedy for this trend towards "socialisation," Dr. Harris proposes that county medical societies incorporate and organise for business purposes, and then establish medical centres owned, controlled, and managed by the profession, where all who cannot pay regular fees may receive adequate treatment at charges which are within their means.

The report of the secretary, Dr. Olin West, also called for aggressive organisation by professional groups, and urged the importance of these groups becoming leaders in the communities in matters of health, and in particular in popular health education. The central organisation in Chicago is already engaged through its Bureau of Health and Public Instruction in these activities. The work of this bureau was warmly approved.

ABUSE OF MEDICAL SERVICE TO HOSPITALS.

The new president of the association, Dr. William Gerry Morgan, dealt in his address with the history and evolution of charitable hospitals and dispensaries. He showed how in their origin they represented a coöperative enterprise, the charitable public providing the physical needs and the profession giving free of charge their professional skill. Now the simple asylum for the indigent sick has become in part the elaborate nursing hotel of the well-to-do, in part the costly laboratory of the surgeon, and in part a necessary instrument of medical education. The fact has been lost sight of that the physician's contribution is still the gift of his skill to the sick person, and that this contribution is not a part of hospital property to be donated or bartered according to the corporate judgment of its trustees. There are, of course, exceptions, such as private hospitals and hospitals constructed and operated entirely by public funds.

Dr. Morgan's conclusions, which are to be considered as a basis for a campaign of re-education of both the lāity and the profession, include the following:—

(*a*) The physician is no more obligated to provide for the care of the indigent sick than his fellow citizen.

(*b*) In mutual charitable undertakings for the care of the sick, each citizen contributes what he has: the laymen, physical necessities; the physician, professional skill. But each has a right to protect himself from exploitation, and to judge of the merit of the recipients of his bounty.

(*c*) When a hospital offers its facilities to a mixed clientele, pay, part pay, and pauper, the distinction between the sources of those facilities should be clearly recognised. The physical equipment and service is of general public origin, and their uses may be sold or given away in the discretion of lay boards; but the professional facilities are, and always must be, the contribution of the medical staff as individuals and cannot become in any sense the property of the institution.

(*d*) When a hospital is owned and operated by government, and supported by taxation, to which the medical profession contributes its due proportion, medical attendance should be paid for by taxation, along with all the other facilities supplied by the institution.

(*e*) No hospital instituted and supported by public philanthropy or community coöperation of any kind should be premitted to increase its revenues, and so reduce its financial burden on the public, by any system of collecting fees for medical attendance, and thus engaging in the corporate practice of medicine.

TARIFFS AND MEDICAL APPLIANCES.

The Board of Trustees of the Association reported on the increased tariff which despite their efforts now falls upon a large number of articles "necessary for the diagnosis and treatment of disease." The duty on surgical instruments is increased from 45 per cent. to 55 per cent. (but not to 75 per cent. as urged by American manufacturers). The tariff on pharmaceutical or surgical instruments wholly or chiefly of glass is increased from 65 per cent. to 85 per cent., and so on. They add that it will be a matter of regret if the increased duty is made an excuse for excessive increases in retail prices.

MOTORING FATALITIES.

The House of Delegates took notice of the "steadily mounting death-rate from motor vehicle accidents, and of the fact that only ten States and the District of Columbia have mandatory examinations of drivers before granting licences. "They resolved that the association should use its influence to secure legislation in all States for physical examination, and that a committee study the subject further and formulate a model standard of physical fitness for drivers that can be recommended to State legislatures.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

IRISH MEDICAL COMMITTEES.

A MEETING of the Irish Medical Committee was held in Dublin on July 16th, Dr. J. M. Day presiding. It was reported that the National Health Insurance Commission had recently made certain deductions from the payments made to medical certifiers for furnishing certificates of medical incapacity. The rates of remuneration had originally been fixed by agreement between the National Health Insurance Commission and the Irish Medical Committee, and the Committee expressed the opinion that no change should have been made without consultation with it. A member reported that in his district a post of medical attendant to a station of the Civic Guard had recently been filled by inviting medical men in the neighbourhood to state the terms on which they would be prepared to give attendance, the post being given to the candidate who offered the lowest terms. The Committee strongly disapproved of such a method of appointment, as likely to lower the standard of medical attendance and as contrary to the principles of the profession. It directed a protest to be sent to the Minister for Justice.

A CONFERENCE ON PUBLIC HEALTH.

Mr. R. Mulcahy, Minister for Local Government and Public Health in the Irish Free State, recently summoned a conference to discuss questions concerning his department. The conference was held early this month in the Mansion House, Dublin, and was attended by representatives, including many medical officers of health, of all the local authorities dealing with health administration. The Minister delivered a stimulating opening address pointing out that the growth of public health work depended primarily on an educated public opinion on sanitary and health matters. Only public opinion could provide the driving force and clear the way for improvement. Dr. J. C. Saunders, medical officer of health for the City of Cork, read a paper on the methods by which health education could be promoted. Communal hygiene, he contended, should be national rather than local, and should be put into effect by a central organisation. The insanitary condition of the schools, especially in rural areas, was a great blot on the social system. The teaching of preventive medicine called for a more important place in the curriculum at medical schools. Dr. O'Higgins, county medical officer of health, Meath, and Dr. McDonnell, medical inspector, Local Government Department, spoke of the need of educating the public and the methods by which this could be done.

Dr. R. Conelly, medical officer of health for the county of Cork, opened a discussion on county health administration with particular reference to the functions of the county medical officer of health. He regarded the supervision of the production and handling of food, especially meat and milk, as of great importance. Where the circumstances of the area made it feasible, by-laws providing for a system of inspection and stamping of all meat before sale should be introduced. The annual report of the county medical officer of health should show the character and extent of the health work done over a given period.

Dr. Mary O'Leary, school medical officer for the county borough of Dublin, read a paper on the Health of the School Child. She urged the need of open-air schools and nursery schools, and in the meantime the establishment of summer convalescent homes or camps. The discussions aroused lively interest, both among the medical officers and the lay members of the local authorities, and the Minister has cause to congratulate himself on the success of the conference.

QUEEN'S UNIVERSITY OF BELFAST.

Presiding at the summer graduation ceremony of Queen's University on July 10th, the Chancellor, Lord Londonderry, said that this was a suitable occasion to "take stock," for the University came of age this year. Twenty-one years have elapsed since the Queen's College attained university rank, and the number of students has increased from 600 to almost 1400. The revenue of the University has not, however, grown at the same rate. The report of the University Grants Committee last year pointed out that Queen's was doing more work on less money than any university in Britain, and it also laid stress on the fact that Queen's was receiving less help from the Government, local authorities, and private benefactors. The six British universities with which it was compared received in gifts from private persons during the past five years sums varying from £479,000, the largest figure, to £66,000, the lowest. Queen's, during the same period, received in private gifts £2435. Lord Londonderry said that a student in any university only paid a third of what his education cost; he appealed to his hearers not to forget this when they left. He hoped that all would join the recently formed Queen's Association.

Before conferring the degrees the Chancellor referred with regret to the death of Dr. T. I. Candy, which had taken place between the reception and acceptance of his thesis for the M.D. degree of the University.

In addition to the names published in THE LANCET of June 28th Samuel Nevin received the degree of M.D., with gold medal. The Adami Medal in Pathology was awarded to William S. Campbell; the Symington Medal in anatomy to David C. Porter, and the Sinclair Medal in Surgery to Arthur G. Ross.

The headmasters of the secondary schools in Northern Ireland consider that the standard of Latin set in the Matriculation for the Faculty of Medicine and in the Senior Certificate examination of the Ministry of Education too difficult for the average schoolboy. The Medical Faculty, unwilling to admit students without some knowledge of Latin, have met the difficulty by new regulations, passed by the Senate, whereby after the session 1931–32 candidates are required to have studied Latin and to have obtained therein 40 per cent. at the Junior Certificate examination or at an equivalent examination. The Senate also adopted regulations for the recently instituted Diploma in Psychological Medicine.

The examinations for medical degrees will henceforth be held in June and December and not in March and June, and the session in the Medical Faculty will commence in the beginning of October and not in the middle of the month.

ROYAL SOUTHERN HOSPITAL, LIVERPOOL.—The number of out-patient attendances last year increased by nearly 10,000 notwithstanding efforts to use the department as a consultative centre for the treatment only of the more serious cases referred by doctors. The principal increases were in the electrotherapeutic and massage and actinotherapy departments. The surgical work is increasing so rapidly that plans have been prepared for the extension at a cost of £25,000 of the operating theatre and X ray unit. In the last five years the number of radiograms taken (13,246) has nearly doubled. There were close upon 17,000 attendances for massage.

THE BEIT MEMORIAL FELLOWSHIPS.

NEW ELECTIONS.

IN 1909 Sir Otto Beit made a gift of £230,000 for the endowment, not of buildings, but of men and women who were equipped and anxious to devote a few years of their lives to research in medicine and the allied sciences, but lacked the means to do so. At first the values of the Fellowships were £350 per annum for three years for Junior Fellows; £400 for fourth year Fellows; and £500 for three years for Senior Fellows. These stipends were increased in 1927 respectively to £400, £500 and £700.

The trustees of the fund are assisted in the selection of candidates by a scientific advisory board, and in the annual report for 1929 this board expresses the opinion, in which all will concur, that the founder has every reason to be satisfied with the results obtained during the first 20 years of the life of the trust. The total number of Fellows elected up to and including 1930 is 138.

Ignoring the more recent appointments, the report analyses the subsequent career of the 101 Fellows appointed up to 1925. We made a similar analysis in THE LANCET (1926, ii., 1019) of the first 70 Fellows, and it is interesting to see that the more recently appointed Fellows follow much the same paths as their distinguished predecessors.

Of the 79 men elected to Fellowships up to 1925, seven died at a relatively early age. Four have received the F.R.S., and 16 have been appointed to University Professorships. Most of the remainder occupy whole-time posts for teaching, research, or scientific work. Of the total of 52 who held medical qualifications when appointed, 13 have passed into medical practice, consulting or otherwise, but the majority of these are continuing scientific work.

Of the 22 women elected during the same period, a few have married, but all continued for many years the work of research and many are still thus engaged. That they hold, or have held, such positions as members of the scientific staff of the Lister Institute; university lectureships in biochemistry; pathologist and bacteriologist to general hospitals and boards of health; head of a department in an institute for medical research; principal of a horticultural college; physicians to children's hospitals, and holders of Rockefeller Medical Fellowships, is sufficient proof of the value to them and to the community of their training.

This year a Senior Fellowship has been given to Dr. R. J. Lythgoe, who is working on the special senses, and fourth year Fellowships respectively to Mr. Philip Eggleton, M.Sc., for work on the different types of contractile tissues and their metabolism, and to Dr. F. R. Winton, who is investigating the physiology and pharmacology of urinary secretion at Cambridge.

The Junior Fellowships for 1930 are allocated as follows:—

Frederick Horace Smirk, M.D. Manch., M.R.C.P. Lond. (1) To study the functional pathology and physiology of diuresis from a biochemical standpoint; (2) to study the functional pathology of plethoras, anæmias, and œdemas.

Gordon Roy Cameron, M.B., D.Sc. Melbourne. To complete work on the histological identification of calcium salts in pathological deposits and to commence study of inflammation in invertebrates. Proposes to investigate reaction of tissues of earthworm to foreign bodies, parasites and bacteria.

John McMichael, M.B., M.R.C.P. Edin. For a continuation of present studies on the inter-relationships of liver and splenic disease and on diseases of portal vessels and other vessel changes in liver disease.

Robert Percival Cook, B.Sc. Melbourne, Ph.D. Camb. For a study of bacterial metabolism and its relation to the specific action between host and bacterial parasite. Proposes to study metabolism of various types of bacteria by (1) chemical changes produced during actual growth in chemically defined media; (2) to study the individual enzyme systems of the bacterial cell.

Norman Urquhart Meldrum, B.Sc. Edin. For (1) a study of the so-called reversible denaturation of hæmaglobin. Intends to determine the influence of factors such as dilution, addition of foreign proteins and influence of acidity on the equilibrium between methæmoglobin, globin, and hæmatin (2) to measure formation of sulphydryl groups in various types of protein denaturation.

David Reginald Piper Murray, B.A.Camb. For comparison of the two types of proteolytic enzyme characteristic of the tissues and organs and of the digestive tract. Investigation to be based on studies of kinetics.

George Norman Myers, M.Sc., M.B. Durh. The curative action of digitalis, its glucosides and allies, in genera toxæmia, and in conditions of shock.

Charles Amos Ashford, B.A. Camb. For studies in (*a*) the metabolism of nervous tissue; and (*b*) mode of action of vitamin D, with special reference to hypervitaminosis D.

Dr. Smirk will work in London at the medical unit of University College Hospital, Dr. Cameron at the Graham Laboratory of University College Medical School. Dr. John McMichael is to work at Aberdeen in the department of medicine of the University and Dr. Myers in the Pharmacological Laboratories at Cambridge. The other four new Junior Fellows propose to carry on their research at the Sir William Dunn Institute at Cambridge.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. E. B. Kenny is placed on the retd. list.

The following appointments are notified: Surg. Comdrs. E. St. G. S. Goodwin to *Suffolk*, and P. L. Gibson to *Malabar*, for R.N. Hospital, Bermuda; A. H. Joy to *Pembroke*, for R.M. Infirmary, Chatham; C. H. M. Gimlett to *Dolphin*; and R. A. W. Ford to *Coventry*.

Surg. Lts. T. B. Lynach to *Nelson*; W. D. M. Sim to *Cambrian*; W. V. Beach to *Adamant*; R. L. G. Proctor to *Vivid*, for R.N. Hospital, Plymouth; and T. A. Cochran to *Greenwich*.

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg. Sub.-Lt. J. D. Lendrum to be Surg. Sub.-Lt.

Surg. Lt. H. M. Willoughby to *Albury*.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. H. M. J. Perry, R.A.M.C., to be Professor at the Royal Army Medical College.

Col. M. H. Babington, late R.A.M.C., retires on retd. pay.

Col. G. T. Brierley, on attaining the age for compulsory retirement, retires on retd. pay.

Maj. and Bt. Lt.-Col. H. M. J. Perry, from the secd. list, is restd. to the estabt.

Capt. J. C. Coutts to be Maj. (prov.).

Lt. (on prob.) W. A. Y. Knight, from the secd. list, is restd. to the estabt.

ARMY DENTAL CORPS.

Capt. P. E. Brown to be Maj.

Capt. J. L. Garrard to be Maj. (prov.).

Capt. G. A. Ballantyne, relinquishes his comm. on appt. to the R.A.F.

ARMY RESERVE OF OFFICERS.

Capt. W. W. Phillips from Supp. Res. of Offs., to be Capt.

TERRITORIAL ARMY.

Capt. W. A. Jackman to be Maj.

Lt. E. A. L. Murphy to be Capt.

C. N. Suter (late Cadet, Edin. Academy Contgt., Jun. Div. O.T.C.) to be Lt.

Capt. G. Williams resigns his commn.

Lt. J. B. Dedman resigns his commn.

ROYAL AIR FORCE.

Squadron-Leader H. J. Proctor (Major, Army Dental Corps) relinquishes his temporary comm. on return to Army duty.

DEATHS IN THE SERVICES.

Lt.-Col. Sidney Browning Smith, C.M.G., late I.M.S., who, as we announced last week, died on July 13th, after a long illness, at Lyncroft, Otford, Kent, at the age of 6[illegible] was the son of Dr. Thomas Browning Smith of Sittingbourne and was educated at Epsom College and St. Bartholomew's Hospital. After qualifying with the Conjoint diploma he joined the Indian Medical Service and took part in the Chitral operations with Sir Francis Younghusband (mentioned in despatches and medal with clasp). After the Waziristan operations of 1901–02 he was appointed district plague officer at Amritsar and later chief plague officer in the Punjab. He embodied his experiences in this connexion in "Plague in India," which he published in 1904. In the late war he served on the western front and in Egypt (mentioned in despatches and made C.M.G.) and he was the organiser of the Mount Dore Hospital for Indian troops at Bournemouth and the clearing station at Karachi. He retired in 1921.

CORRESPONDENCE

THE INTERPRETATION OF DENTAL RADIOGRAMS.

To the Editor of THE LANCET.

SIR,—The letter by Dr. Brailsford in your last issue contains several remarkable statements. His suggestion that the conception of dental sepsis as a factor in the causation of general disease was forced on a reluctant and hostile dental profession by the medical profession is a ludicrous travesty of the facts. It is true that the credit for formulating this view was due to Dr. William Hunter. At first, no doubt, his views were received with incredulity by both doctors and dentists, but they very quickly became accepted by both, and it is much nearer the mark to say that Dr. Hunter's work has received the strong support of the dental profession as a whole almost from the first. Over 20 years ago, when I was a dental student, the doctrine of dental sepsis in relation to general disease was vigorously taught at the Royal Dental Hospital, and the cult of the clean mouth practised with equal vigour. Indeed, one may say fairly that for the last two decades in this country the dental profession has accepted Hunter's views as unquestioned in the same way as the doctor has accepted the principles of Listerism. It is true that some dentists have tried to infuse a note of caution because of the many cases they see in which the removal of undoubted dental sepsis has failed to relieve the patient who has thus had the burden of an edentulous mouth added to his other ailments. An uncritical acceptance of a theory is even worse than scepticism, and I would suggest that it is to our credit that we have tried to rationalise Hunter's work and to make the treatment of dental sepsis as a therapeutic measure an instrument of greater precision. The dental surgeons "of repute" (though I have yet to meet them) may be fairly balanced by those doctors who still ignore the significance of dental sepsis.

I fully appreciate the work of radiologists in demonstrating the existence of dental lesions otherwise not easily discoverable, but I would point out that radiology owes much to the pioneer work of dentists in this field, and that many of the advances in the assessment of the significance of dental radiograms has been made by dentists, whether practising radiology exclusively or not. In your editorial you say that dentists in general do not attach much importance to the reports on radiograms. It is truly a commonplace in conversation among dentists that the reports which usually accompany a set of radiograms, while useful no doubt to the medical practitioner, tell the dentist singularly little, and often require considerable correction when correlated with the clinical findings. How many radiologists ever ask the dentist in his turn to furnish a report showing the clinical or post-extraction findings so that he may know how far his interpretations are borne out? I have not heard of any who do this.

Those who study the actual conditions as revealed during the course of treatment know that there is by no means an exact correspondence between these and the appearances shown in the radiogram. If Dr. Brailsford would refer to Weston Price's book on dental infections he will find there an instructive chapter on the capabilities and limitations of X rays. In THE LANCET (1929, ii., 375) Dr. D. A. Imrie, who is a radiologist possessing a dental qualification, tried to correlate the X ray and pathological findings of some cases of dental infection, but such laudable efforts are unfortunately rare. The usual reports obtained from radiologists not possessing the familiarity with dental conditions which a dental training brings with it, follow a stereotyped line. They often contain inaccuracies and reveal clearly that the writers of them are ill-acquainted with the elements of the anatomy and pathology of the teeth and jaws. Dr. Brailsford implies that the dentist who does not limit himself to radiology is technically not equipped to take good radiograms. As a teacher of dentistry I see a large number of dental radiograms, and among them some bad ones. Radiologists, radiographers, and dentists have all contributed bad ones, but I should certainly not say that dentists sin in this respect more than others. On the contrary, dentists who take their own radiograms without specialising in this subject are usually quite competent to do so, and produce radiograms free from distortion, and with the light and shadow well contrasted. I know that dental students soon learn to recognise the essential points in a radiogram. Such an error as that described by Dr. Brailsford, of mistaking a large apical abscess for the antrum must surely be uncommon. I myself have seen the mental foramen solemnly described as an abscess in a report by a radiologist. I have seen a cyst involving an upper lateral incisor and showing as a large area of rarefaction in the film, overlooked in the radiologist's report, because it had evidently been mistaken for the antrum, though a very elementary knowledge of the anatomy of the jaws should have made it clear that the antrum does not extend to the incisor region. But recriminations of this sort are not very helpful. I look forward to a time when every dentist will possess his X ray apparatus just as he possesses a dental engine, for apart from the routine examination of the mouth for the investigation of dental sepsis, radiograms are very helpful in the everyday routine of dental practice, and the dentist who cannot take his own radiograms is undoubtedly handicapped. The radiologist who takes really fine radiograms and can accompany them with a report which is accurate and helpful will always find plenty of dental work referred to him both by doctors and dentists. I regard Mr. Henry's articles as conveying an extremely lucid exposition of a difficult subject, the more valuable because of his all-round knowledge of dental surgery and pathology.

I am, Sir, yours faithfully,

Brook-street, W., July 19th, 1930. A. T. PITTS.

MENINGO-ENCEPHALITIS AND HERPES ZOSTER.

To the Editor of THE LANCET.

SIR,—Apropos of the article in THE LANCET of July 12th by Drs. Schiff and Brain, entitled "Acute Meningo-encephalitis associated with Herpes Zoster," you may be interested in the following account of a case I saw for the first time a week ago.

A healthy looking married woman of 30 went to her doctor on June 18th complaining of weakness in the right arm and numbness and tingling in the fingers of the same side which had spread up the arm as far as the shoulder. On the 25th she was somewhat better; the abnormal sensations being confined to the thumb, index, and little fingers. On the 30th the whole forearm was involved, but

the greatest amount of paræsthesia was still in these fingers. In addition there was a patch of herpes over the seventh cervical vertebra. On July 6th pain developed in the right heel accompanied by numbness, still present on the 11th when she saw me.

I found herpes over the seventh cervical vertebra as stated and also in front over the right sterno-clavicular joint, with a few vesicles extending across the mid-line. The face was normal. There was marked weakness in the right grasp and in the triceps. There was anæsthesia to light touch, to vibration, to temperature, and to pinprick from the tips of the fingers to the upper arm at shoulder level. In addition there was definite wobbling in the finger-nose test on that side. The right leg showed similar sensory changes as high as the knee. I could detect no ataxia in the leg; the heel was painful to stand on. The reflexes were all normal; the abdominals could not be elicited. The left side was normal.

There had been a certain amount of headache since the illness began but not at all severe. There had been no eye trouble, and she was feeling much better than she had been.

I saw the patient again to-day, when I found that marked improvement had taken place. The anæsthesia was confined to the right thumb and index; the grasp was still weak but greatly better than a week ago. An examination of the C.S.F. was not done; it did not seem worth while in an illness already over three weeks old when I first saw the patient. I am, Sir, yours faithfully,

Coventry, July 18th, 1930. W. FRASER ANNAND.

EFFECT OF RADIUM ON CARCINOMA.

To the Editor of THE LANCET.

SIR,—The question whether it is possible to stimulate malignant cells by means of irradiation, and if so, whether that stimulation is direct or indirect, is still in dispute, but every surgeon, I think, will agree that if a malignant growth is cut into with a knife, needle, or any other instrument, cells may be disseminated, and, moreover, their actual growth may be stimulated by the tissue juices created as a result of the trauma.

Mr. Romanis, in his interesting note, has not excluded these possibilities, and I would suggest therefore that the only thing he can deduce is that the radium did not kill the cells that were in the track of the needle. If radium plaques had been used and the growth had been increased near those plaques, there would have been more justification for assuming that irradiation could in some cases stimulate malignant growth.

I am, Sir, yours faithfully,

Harley-street W., July 19th. MALCOLM DONALDSON.

CONGENITAL ATRESIA OF THE ŒSOPHAGUS.

To the Editor of THE LANCET.

SIR,—A few days before Dr. Polson's paper on atresia of the œsophagus was published in your last issue I attended at the delivery of a child that presented this as well as several other congenital abnormalities. He was born on July 12th, at full time after a pregnancy and labour that presented no abnormality of note. The mother was a primipara, aged 22. The baby appeared to be fairly healthy at birth and weighed 6½ lb. A few hours after birth it seemed to have considerable difficulty with respiration and quantities of rather viscid froth were brought up with difficulty. At intervals it became cyanosed. The quantity of froth prevented any attempt at feeding. On account of an imperforate anus the child was removed to Rochford Hospital, where Dr. Newey attempted to find the rectum by the perineal route but without success. The child died on July 15th. The following day I was present at an autopsy carried out by Dr. Newey. The condition of the œsophagus was almost exactly as shown in the illustration given by Dr. Polson. In my case there was not so much hypertrophy and dilatation of the upper portion as he shows, and the lower portion opened into the trachea at the level of the bifurcation. In addition the child presented the following congenital abnormalities: (1) imperforate anus with complete absence of the rectum, the pelvic colon ending blindly; (2) hydronephrosis of the right kidney with no connexion between pelvis and ureter; (3) patent foramen ovale; (4) absence of the right thumb; and (5) abduction of the right hand at the wrist. The lungs showed a marked degree of interstitial emphysema arising apparently from the difficulty with respiration.

I am, Sir, yours faithfully,

C. P. DONNISON, M.B., B.S. Lond.

South Benfleet, Essex, July 21st, 1930.

THE OUT-PATIENT QUEUE.

To the Editor of THE LANCET.

SIR,—The cure of the overcrowded out-patient department to which you referred last week is largely in the hands of the management of the hospital. It is the indiscriminate welcome accorded to all and sundry who apply for treatment that is at the root of the trouble. I would suggest that, except for emergencies, no patient be seen in an out-patient department unless he brings a letter from a doctor or proves that he is not insured under the National Health Insurance Act, and is too poor to afford even the most modest doctor's fee.

I am, Sir, yours faithfully,

Westbourne Park-road, W., July 19th. J. COHEN.

THE PROPER STRAPPING OF THE CHEST.

To the Editor of THE LANCET.

SIR,—Dr. C. W. Chapman, in his letter on Left Inframammary Pain which appears in your issue of June 28th (p. 1434), properly calls attention to the value of strapping of the chest in those cases where the pain is manifestly made worse by the movements of respiration. But in his description of how strapping should be done he leaves out the important point that the strips should be drawn tight and pressed firmly into position while the patient's chest is in the position of *full expiration*. Unless this detail is attended to, the movements of the side are little affected by the presence of strapping on the surface. Another point not mentioned, but no doubt assumed, is that the straps should run horizontally round the side of the chest, thus crossing the line of two or more ribs, and so increasing the fixation aimed at.

I feel like apologising, Sir, for thus mentioning such apparently small points, but it is the attention to details in many therapeutic measures that makes all the difference between success and failure.

I am, Sir, yours, faithfully,

Toronto, July 8th, 1930. R. D. RUDOLF.

OPENING OF BETHLEM ROYAL HOSPITAL.—The new hospital at Monk's Orchard, Beckenham, of which the foundation-stone was laid in July, 1928, by Prince Arthur of Connaught, was opened by the Queen recently. The hospital, which has cost £450,000, stands in its own park of 200 acres, a few minutes' walk from Eden Park station (S.R.) and on the ten mile circle drawn round Charing Cross. Patients will for the most part have separate bedrooms, with a few four- and five-bed wards for special purposes. The move from Lambeth will soon follow. The cost of laboratories for routine and research work has been met by a gift from Lord Wakefield.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

HEALTH ADMINISTRATION IN SCOTLAND.

THE House of Commons on July 14th considered in Committee of Supply a vote of £1,651,592 to complete the sum of £2,791,592 required for the salaries and expenses of the Department of Health for Scotland. Mr. HERBERT DUNNICO was in the chair.

Mr. ADAMSON (Secretary of State for Scotland), in moving the vote, referred to a few of the outstanding figures in the vital statistics for 1929. He said the birth-rate was 19·02, the lowest since compulsory registration was introduced in 1855. The death-rate was 14·5 per 1000, slightly higher than in the previous year, but this was influenced by an epidemic of influenza in the first quarter, during which respiratory diseases had an adverse effect on the infantile mortality —86·8 per 1000 births. The maternal mortality-rate for 1929 was 6·9 per 1000 births, as compared with 7·0 for the preceding year, the schemes of maternity and child welfare showing little result. Investigations were being made into all deaths of married women during pregnancy, or within four weeks of its termination. There was already a quite definite indication of the need for more complete medical supervision. An effort would be made to secure an adequate antenatal service under the Local Government (Scotland) Act, 1929. But the mothers themselves must coöperate by making a fuller use of the services provided, and this would have to be secured by stimulating their interest in these services through education.

DECLINE OF TUBERCULOSIS.

Here he was able to present a more encouraging picture. The death-rate from all forms of tuberculosis, 94 per 100,000 of the population, was the lowest yet recorded, being 3 per 100,000 less than the record figure for 1928. Actually 4579 persons died from tuberculosis in 1929, whereas in 1919 the figure was 6376.

THE COST OF MEDICAL BENEFIT.

He pointed to the value of improved diagnosis and extended institutional treatment, but said that the amounts expended by approved societies in sickness and disablement benefits were still abnormally high. In 1929 the amount so expended was £1,924,000, or an increase of £200,000 over the corresponding figure for 1928. The severe epidemic of influenza in the early months of 1929 would account for some part of the increased expenditure. But after making allowance for this, and for a slight increase in the number of insured persons at risk last year, there remained a considerable part of the increase for which no satisfactory explanation was available. The department had been in conference with the approved societies and with a special committee of the Insurance Acts subcommittee of the British Medical Association, but it had not hitherto been possible to publish accurate statistical information concerning incapacitating illness among the insured. Now, however, they had put into operation, on July 1st of this year, a scheme for collecting complete and trutsworthy data from the approved societies from which might be compiled statistical records, inter alia, (1) the incidence of the various incapacitating diseases and their duration, not only for insured persons generally, but for groups of insured persons arranged according to area of residence, occupation, age, &c.; and (2) the extent to which individual medical practitioners were granted certificates of incapacity for work. The scheme was considered recently at a conference between the department and representatives of the larger approved societies in Scotland, who promised coöperation. It was hoped that the morbidity statistics, when published, would be of great advantage to the local authorities.

Sir ROBERT HAMILTON said they had recently passed an Act to put the Highlands and Islands Medical Fund on a stable basis. There was no fund of its size which was so well administered, or which did so much good over so large an area. But in looking into the figures he had been disappointed.

HOUSING PROGRESS.

Dealing with the housing question in Scotland Mr. ADAMSON said that up to May 31st, under all forms of State assistance, 110,136 houses, accommodating 495,000 people—a ninth of the working-class population of the country—had been completed, but 100,000 more houses were required. The average reduction in cost under falling prices was estimated at £75 per house, and the new county councils in Scotland had been urged to see that the utmost advantage was taken by rural owners of the Housing (Rural Workers) Act, 1926. He looked forward to activity from the local authorities when the Slum Clearance Bill became law.

Sir JOHN GILMOUR referred to his personal responsibility for the changes now taking place, for which he said no claim was made that they were unalterable. There was now an opportunity for coördination and linking the health of the child from earliest years through school-days and from school-days onward. If the health of the child only were assisted by the new coördination the Act would be justified. There was an obligation now on Parliament to set aside year by year whatever sum might be necessary for carrying out health services in the north of Scotland in addition to the £42,000 provided under the 1913 Act. There was a total of £72,000 provided in the present estimates. Last year £74,800 was available, and with the extension of the services he found the provision insufficient. He hoped the Government were not intending to contract the finances of the fund, but were rather looking forward to its expansion. The extension of the nursing services in the country districts in the north of Scotland had been invaluable. But the difficulty of the nurses getting about was very considerable, and he was glad that the department proposed that in future they should be supplied with light cars. Another direction in which very useful work had been done by the fund was in helping to build doctor's houses. But there were one or two cases where delay had taken place in this respect. He called particular attention to the case of the island of Whalsay, in the Orkneys, where a doctor's house was not yet built, and the doctor on the island had been living in most uncomfortable conditions. Another piece of useful work which the department had done was in putting doctors' houses on the telephone. The department had subscribed the money and had thus got over the parsimony of the post-office in the interests of humanity. The department should insist that every doctor in a country parish where there was a telephone service should be put upon the telephone. Referring to the position of the hospital in Lerwick, Sir R. HAMILTON said a considerable sum was raised annually—as much as the poverty of the people would allow—in order to enable that hospital to keep going. But since the Government department had given the services of a consulting surgeon the hospital had become almost full of surgical cases, and there was practically no room for ordinary medical cases. All the surgical cases which used to go to Aberdeen and Edinburgh were now being dealt with locally. He wished to ask the Secretary of State for Scotland whether it was possible to make a grant from the fund for the extension of a local country hospital which was doing such magnificent work.

Mr. MCGOVERN urged that the Secretary for Scotland should at the earliest possible moment call a conference of all public assistance committees in Scotland with a view to dealing with the totally inadequate scales of relief to unemployed workers.

Mr. MACQUISTEN suggested that there were in the Highlands a great many manses, and while it appeared difficult to get the lad of parts to go in for the Church, it occurred to him that there might be a combination in many of the districts of the Highlands of the clergyman and the doctor, with the manses as residences.

Mr. MACPHERSON said he wished to plead for the class of hospital such as the Invergordon Hospital—a sanatorium hospital. He was anxious that the good work started locally by local authorities should be assisted where necessary by the Government. The hospital at Invergordon was exceedingly well managed, and he could say the same about every other hospital of that class. There were the Ross Memorial Hospital at Dingwall and the Northern Infirmary at Inverness. They had established under the ægis of the Department of Health a specialised service of highly skilled consultants and surgeons. By developing the hospital system in the north of Scotland they were easing the burden of the hospitals in the south, and benefiting not only the local community but the community as a whole. He hoped that they would have an assurance from the Government that they would not only maintain the grant of £72,000 for the Highlands and Islands Medical Service, but if need arose they would persuade the Chancellor of the Exchequer to add to the guarantee.

Mr. HARDIE, referring to Mr. Macquisten's suggestion, said that if a man was fit for medical work he must concentrate on medical science, whereas if he was fit as a spiritual adviser he must confine himself to spiritual subjects.

Mr. R. W. SMITH said he hoped the Government would see that school teachers considered it part of their duty to see that school-children were clean and tidy, ensuring thus that mothers would be more willing to visit the maternity welfare centres.

Mr. RAMSAY said that the question of the delegation of health services to the island of Lewis had caused something like a deadlock for a considerable time. The county councils of Inverness and Argyll had delegated the health service to a specific committee belonging more or less to the islands of these two counties, but unfortunately the people of Lewis had not received a similar delegation. He hoped that the Under Secretary would give them an assurance that something would be done in this respect, because it was a serious thing from the health point of view in Lewis. The late Government and the present Government had done splendid work for Lewis in establishing the Lewis Hospital, but he wished that provision were made for more ambulances and stretchers. A recent case was brought to his notice of a man suffering from peritonitis who died, largely because no near ambulance or stretcher was available to take him to hospital.

Mr. LOVAT-FRASER called attention to the dental service in the Highlands and Islands, and urged that further provision should be made in that respect.

Major ELLIOT, referring to the general improvement of public health in Scotland and especially to tuberculosis figures, pointed out that, while water-borne diseases had been practically conquered and food diseases were in the way of being conquered, air-borne diseases were still completely unsubdued. He referred to the incidence of epidemics among crowded and tenement populations, and pointed out that, taking pre-school children into account, bronchopneumonia, measles, and tuberculosis accounted for 57 per cent. of the deaths. To clean up the air would take a long time, but lung diseases especially were a sign of lowered resistance. While other figures showed that the fundamental resistance of the race was not being safeguarded, attention would give the best results if focused on the child. If they had not a sound child between the ages of 1 and 5, it was useless to try to pump education into such a child between 14 and 16. The report to the department spoke of defective vision as the greatest difficulty in the matter of the school-child. As a sufferer from defective vision, he was quite sure that rheumatism, toothache, or anæmia constituted the greater prejudice to the absorption of knowledge. Scotland, it appeared, had turned largely towards preserved foods, and the necessity of studying these products scientifically stood out. During the last ten years the poor-law authorities had spent ten millions on the purchase of food for the poor-law population of Scotland without any examination of the principles governing dietetics. He referred to the physiological value of the generally rough food on which our ancestors lived.

Mr. JOHNSTON (Under Secretary of State for Scotland), replying to the debate, said it was far too early to say how the new Local Government Act was being fitted into the machinery of local government in Scotland. The machinery creaked a little here and there. It creaked rather badly in Lewis, and they had considerable difficulty in fitting in the desire of the people for local government and financial autonomy, with considerable State subventions, with the control which was being exercised by the county council of which it formed a part. But it was fair to say that the Act was working with considerable facility and smoothness taking the country as a whole. With regard to St. Kilda, the evacuation of which had been discussed, the Government would take every possible step to see that the people were accommodated in future in better surroundings. The poverty under which they had lived was almost indescribable, and they were faced with famine. Had it not been for the Queen's nurse, who stayed in the island during the last two winters, Heaven knew what tragedies would have occurred. He could assure Sir R. Hamilton that the department had every sympathy with the point of view he had expressed, and they were not at all desirous of cutting down the expenditure in respect of the Highlands and Islands Medical Fund. They proposed to assist telephones in the rural areas. The Secretary of State and he had been giving the question of calling a conference of public assistance committees to discuss the equalisation of the present scales of relief, particularly so far as they applied to children, very serious consideration. He would not follow Mr. Macquisten in his irrelevant but rather humorous dissertation upon medical missionaries among the aborigines of the West Highlands. They were sending inspectors to local authorities, and doing everything in their power to induce them to make the maximum effort to improve rural housing in Scotland. He agreed with Major Elliot that they were making very considerable progress in public health, not only in regard to tuberculosis, but along other lines. They were making some progress in regard to nutrition, and if their milk experiment succeeded they would make a great advance in that direction. They were also making progress in regard to fresh air. There was nothing which the Secretary of State was conscious of having left undone in the new Housing Bill to wipe away the slums in Scotland, and to secure a healthier environment for the next generation.

The vote was agreed to.

THE HOUSING (SCOTLAND) BILL.

The Housing (Scotland) Bill was considered on report in the House of Commons on Tuesday, July 15th.

On the motion for the third reading of the Bill

Mr. ADAMSON (Secretary of State for Scotland) said the discussions had shown that in its main structure the measure was generally acceptable to the House and also to the local authorities. A number of suggestions had been put forward from all sides of the House for its improvement, and the Government had met to a very large extent the representations of members of the opposition. The Bill, in the main, however, so far as the procedure for

dealing with slum areas and individuals in insanitary houses were concerned, remained substantially unaltered. He was satisfied that the terms of the new grant were much more favourable to the local authorities than the present grant, and that in practice it would be found that the terms were exceedingly generous. They had been so designed as to offer the greatest inducement to local authorities to erect the larger sized houses which were so badly needed in Scotland for the rehousing of families. He appealed to the local authorities that they should at once proceed actively to put their powers into operation, and wipe away the reproach which had so long rested on Scottish housing.

Major ELLIOT said that it was not possible for Scotland to call itself civilised so long as children were kept awake by vermin, or walls were allowed to be built in front of windows so that it was not possible to see the light of day, and people had to burn gas throughout the 24 hours. But these great evils could not be remedied by State action alone. In many ways the housing conditions in England were an example to Scotland. What was improving and saving the situation in England was the great programme of unassisted houses which was being carried out south of the Border, and unless Scotland could get this assistance into her housing problem it would lag behind England in reaching a solution.

Dr. FORGAN congratulated the Government on producing in this Bill easily the best measure of the present Parliament. The simplification of machinery would enable local authorities, should they so wish, to proceed at a more rapid rate with the demolition of slums and with an attempt to deal with overcrowding. Overcrowding in Scotland was incomparably worse than in England. There were 98 per cent. of those living more than four in a room who were living in either one or two-roomed houses; of those living more than three in a room, 90 per cent. were housed in either one- or two-roomed houses; and of those living more than two in a room 77 per cent. were in one- or two-roomed houses. This Bill compelled local authorities to face the facts of the situation. There was to be a survey at once, and then another three years hence, and subsequently one every five years. In the past local authorities had been content to rely on old statistics. The more stringent the local authority made its standard of housing the bigger the grant which it would be able to earn in an improvement area.

After further debate,

The Bill was read a third time.

In the House of Lords on Tuesday, July 22nd, the Housing (Scotland) Bill, which has passed through the House of Commons, was read a second time. On the same day the Commons amendment to the Workmen's Compensation (Silicosis and Asbestos) Bill was agreed to.

INSURED PERSONS AND OPHTHALMIC BENEFIT.

On Tuesday, July 15th, in the House of Commons, Mr. WOMERSLEY moved "That an humble Address be presented to His Majesty praying that Regulation 25 of the National Health Insurance (Additional Benefits) Regulations, 1930, dated 18th June, 1930, be annulled." The portion of the regulation to which he raised objection read as follows:—

"Where a member has submitted himself to the examination of a medical practitioner under the scheme of a body or organisation which provides both ophthalmic examination and optical appliances, he shall not be entitled to obtain the appliance prescribed by such practitioner from an optician who is not associated with that body or organisation."

Under the present arrangements, the hon. Member continued, there was a body of qualified opticians known as the Joint Council of Qualified Opticians. They had been prescribing for some considerable time for members of approved societies, and the arrangement had worked very satisfactorily indeed. Now, however, the ophthalmic surgeons had set up the National Ophthalmic Treatment Board, and they had taken on to that Board certain firms who supplied optical glasses, with a request to the Ministry of Health that special privileges should be given to the Board. The speaker went on to say that although the fees under the new arrangement had been lowered, the number of opticians was insufficient, and, as there was no complaint against the previous methods of carrying on the work, the approved societies wanted to know the reasons for the change.

Mr. BIRD, in seconding the motion, spoke generally of the position of those who had passed the examination of the British Optical Association or that instituted by the Company of Spectacle Makers.

Mr. GREENWOOD (Minister of Health) said that arrangements for additional benefit must be dealt with by the Regulations, which were formulated after full consultation with the Approved Societies Consultative Council of the Ministry. He was not concerned with differences of opinion between the medical profession and the Joint Council, save that he would hold the balance as fairly as he could. Any approved society would be free to make its normal arrangements if it was providing ophthalmic treatment directly with a representative body of opticians, and in the vast majority of cases that was the course which would be followed. The leading organisation of opticians was the Joint Council of Qualified Opticians. The British Medical Association had made two alternative schemes with a view to making it possible for societies to get advice from ophthalmic surgeons with a minimum of cost. In the first scheme they had prepared a list of medical practitioners who had experience of dealing with ophthalmic cases and were willing to test the sight of insured persons and prescribe glasses. Under this scheme the insured person, having got his prescription, could go to any qualified optician throughout the country. The second scheme was a combined one, and was an arrangement between the medical profession on the one hand and a body not representing a large number of firms, the Association of Dispensing Opticians, on the other hand; firms, he imagined, to which most members of the House of Commons went when they had their prescriptions made up. They were people who never prescribed, but always made up prescriptions from ophthalmic surgeons. Under that combined scheme it was quite clear they could not have that free choice of opticians which they had under other schemes. But the insured person need not adopt this scheme unless he wanted to. There was no hardship in that. He was not prepared to accept entirely the medical view, or the view of the Joint Council. While there might be many cases which might be attended to by the Joint Council there might be many other cases where skilled advice was imperative, but the two bodies would meet everybody's needs. He hoped the House would not be so ill-advised as not to permit these Regulations to go through, but would allow them to pass as provisional Regulations designed for the benefit of insured persons.

Mr. RHYS DAVIES protested against the limit of choice given to the insured in the matter of ophthalmic treatment, but Dr. MORRIS-JONES said that if the Regulation were deleted it would take away what opportunity for choice there was; and after further discussion the motion for an address praying that the Regulations should be annulled the motion was rejected by 144 votes to 23.

WORKMEN'S COMPENSATION (SILICOSIS) BILL

On the motion for the third reading of the Workmen's Compensation (Silicosis) Bill, in the House of Commons on July 15th,

Dr. VERNON DAVIES said that many men who had been in the industry for 15 or 20 years would show on examination signs of silicosis, and in that case employers might use that as a means of dismissing them in order to avoid future compensation.

If a workman was compulsorily suspended before he became disabled would he be entitled to compensation?

After further debate,

Mr. SHORT (Under Secretary to the Home Office) said that so far as he was aware there had been no complaint in connexion with the various schemes in operation respecting dismissals from the causes indicated by Dr. Davies. At the same time it was possible under Section 47 of the Workmen's Compensation Act to cover the two points.

The Bill was read a third time.

HOUSE OF LORDS.

THE SLUM CLEARANCE BILL.

On Monday, July 21st, The Housing (No. 2) Bill passed through Committee.

HOUSE OF COMMONS.

THURSDAY, JULY 16TH.

Unhealthy Labour Conditions in East London.

Major NATHAN asked the Minister of Labour whether she was now in a position to make a statement regarding the sweated wages and unhealthy conditions of labour among many out-workers in East London, and particularly in the boot and shoe industry.—Miss BONDFIELD replied: The inquiries by my Department with regard to wages in the boot and shoe trade in East London are still in progress, and will not be completed for some time. The question of unhealthy conditions of labour is one for the Home Office.

Sale of Poisonous Drugs from Automatic Machines.

Dr. MORRIS-JONES asked the Home Secretary whether he was aware that drugs of a poisonous character could be procured from automatic machines outside chemists' establishments in the county of London; and whether, in view of the Poisons and Pharmacy Act, 1908, and the danger involved to the public, he would cause such vendors to be prosecuted.—Mr. CLYNES replied: I have seen in the press the report of a case in which the legality of such sales was raised, and the Judge decided that they involved a breach of Section 3 of the Poisons and Pharmacy Act, 1908. The proceedings for the recovery of a penalty under that section are of a civil character, and are instituted by the Registrar of the Pharmaceutical Society, and I have no power to intervene. I understand the case in question was arranged by the Pharmaceutical Society for the purpose of testing the legality of such sales, and the judgment will, no doubt, be taken note of by those concerned.

Street Accidents to Policemen in London.

Mr. HACKING asked the Home Secretary the number of police officers engaged on regulation traffic in the Metropolitan police area who had been either killed or injured during the past 12 months; and whether all officers engaged upon this duty are compelled to wear white sleeves.—Mr. CLYNES replied: 171 officers were injured, none fatally. Officers engaged on this duty are required to wear the white gauntlets provided, but it occasionally happens that an officer has to take up traffic duty at short notice without gauntlets.

Malnutrition among School-children.

Mr. MCSHANE asked the President of the Board of Education if he would institute comparative medical examinations of representative samples of school-children, of men who had been for some time unemployed, and of men belonging to the regularly employed artisan class.—Sir CHARLES TREVELYAN replied: Apart from the practical difficulties involved I doubt whether the investigation suggested would lead to any useful results. I may, however, point out that it is the duty of local education authorities, as part of the ordinary work of the school medical service, to discover whether children are suffering from malnutrition, and that in areas where industrial depression is acute special steps are taken to keep a close watch on the health of the children, and to provide supplementary nourishment in cases of need.

Poison Gas Experiments on Living Animals.

Mr. FREEMAN asked the Secretary of State for War whether he had any evidence showing that poison gas and other experiments on living animals being conducted at Porton threw any light on the effects of such poisons on human beings.—Mr. T. SHAW replied: The results which have been obtained both during and since the Great War show that experiments on animals at Porton give definite evidence of the mode of action of poison gases on human beings. Indications are also obtained of the curative treatment which should be adopted, and I am advised that the knowledge thus gained resulted in great alleviation of human suffering during the Great War.

Medical Attention for Families of Naval Men.

Mr. HORE-BELISHA asked the First Lord of the Admiralty what arrangements were in force for providing medical attention for the families of officers and men in the Navy.—Mr. AMMON (Parliamentary Secretary to the Admiralty) replied: The families of officers and men in the Navy are not entitled to medical attention at the public expense. As a privilege, however, the families of Naval personnel serving in particular appointments in certain shore establishments and the families of Royal Marines resident in barracks are afforded free medical treatment by the medical officer of the establishment subject to certain conditions, one of which is that no extra expense to Navy Votes is thereby entailed. As an exceptional measure, a contribution from Naval Funds is also made in approved cases towards the cost of the treatment afforded, either in the Military Hospital or in the King George V Merchant Seamen's Hospital, Malta, to the British wives and families of ratings who, having joined the Navy in the United Kingdom, are temporarily resident at Malta while serving on the Mediterranean Station. Assistance has also been given by means of a grant from the residue of the Naval Prize Fund to enable them to obtain out-patient treatment and medical attention in their own homes at reduced rates. This latter privilege is applicable also to families of Officers.

Tuberculosis in the Navy.

Mr. MARKHAM asked the First Lord of the Admiralty how many stokers or engine-room artificers had been invalided with tuberculosis from the Royal Navy during the past year.—Mr. AMMON replied: The numbers of stokers and engine-room artificers invalided from the Royal Navy on account of pulmonary tuberculosis during the year Jan. 1st–Dec. 31st, 1929, are as follows:—

Chief Stokers ..	2	Chief Engine-room Artificers	4
Stoker Petty Officers	11	Engine-room Artificers ..	11
Leading Stokers ..	10	Engine-room Artificer Apprentices	2
Stokers	35		
	58		17

Deaths from Small-pox.

Mr. BROAD asked the Minister of Health what were the latest figures showing the number of small-pox deaths registered in France, Germany, Italy, Switzerland, Spain, Austria, Norway, Sweden, Denmark, and Russia.—Mr. GREENWOOD replied: According to the official returns received from the countries in question, no deaths from small-pox were registered during the year 1929 in Germany, Switzerland, Austria, Norway, Sweden, or Denmark, while three deaths occurred in Spain. According to the figures published by the Health Section of the League of Nations there were no deaths from small-pox in France during 1929, while five deaths occurred in Italy during 1927, which is the latest year for which information is available in respect of that country. No particulars are available in regard to deaths from small-pox in Russia.

Medical Examination of War Pensioners.

Mr. STEPHEN asked the Minister of Pensions if he was aware that an applicant for increase of pension on the ground of deterioration was not granted a full medical board; under what regulation such claims were considered only by one medical officer; and if he would take steps to see that a full medical board was granted in each case, and that the man's own medical adviser, who was fully conversant with the man's condition, was consulted before a decision was arrived at.—Mr. F. O. ROBERTS replied: Medical examination and certification may, under the terms of the Warrant, be carried out by one or more medical officers, according to the circumstances of the case. The class of case to which my hon. friend refers is one in which examination by an experienced medical officer is normally sufficient, though a specialist or another medical officer may be associated with him where necessary. Opportunity is given, especially where an applicant has been recently under the care of his private practitioner, to furnish any statement from such practitioner, and full consideration is always given to the statement, but it would not be practicable or necessary to adopt the practice suggested by my hon. friend in every case.

MONDAY, JULY 21ST.

Deaths from Small-pox.

Mr. GROVES asked the Minister of Health how many deaths from small-pox occurred in the year 1929; the ages of the cases; and the vaccinal condition of each case.—Mr. GREEN-

WOOD replied: During the 52 weeks ended Dec. 28th, 1929, 39 deaths occurred in England and Wales which were classified to small-pox. The ages and vaccinal condition of these cases are shown in the following table:—

Age.	Vaccinal condition.	Age.	Vaccinal condition.
3 days.	Unvaccinated.	34 years.	One unvaccinated,
14 ,,	,,	(2 cases).	One vaccinated.
3 weeks.	,,	36 years.	One unvaccinated.
(2 cases).		(2 cases).	One vaccinated.
1 mth.	,,	37 years.	Unvaccinated.
2 mths.	,,	42 ,,	Vaccinated.
8 ,,	,,	43 ,,	,,
(2 cases).		44 ,,	Unvaccinated.
16 mths.	,,	45 ,,	Vaccinated.
2 years.	,,	(2 cases).	
9 ,,	,,	59 years.	,,
13 ,,	,,	61 ,,	,,
14 ,,	Vaccinated.	63 ,,	Unvaccinated.
16 ,,	Unvaccinated.	64 ,,	,,
17 ,,	,,	65 ,,	One vaccinated.
20 ,,	Vaccinated.	(2 cases).	One doubtful.
24 ,,	Unvaccinated.	66 years.	No information available.
25 ,,	,,		
28 ,,	Vaccinated.	74 ,,	Doubtful.
29 ,,	,,	75 ,,	Vaccinated.

I may add that all the vaccinated persons had been vaccinated in infancy only and, as the table shows, they were aged 14 years and upwards at the date of death.

Residential Treatment for Tuberculosis.

Mr. DAY asked the Minister of Health the latest available figures of persons undergoing residential treatment for tuberculosis from the local authorities in England and Wales, and the number of persons awaiting admission to sanatoria at the same date.—Mr. GREENWOOD replied: The number of patients receiving residential treatment for tuberculosis under the approved schemes of local authorities in England and Wales on the 1st July, 1930, was 22,575. The number who, on the same date, had been awaiting admission to residential institutions for more than ten days was 3232.

Recruitment for Indian Medical Service.

Major GRAHAM POLE asked the Secretary of State for India what action the Government proposed to take in regard to the resolution passed at the conference of representatives of the provincial governments and the medical faculties convened at Delhi in June, requesting the Secretary of State to change the rules governing recruitment to the Indian Medical Service, so as to remove the provision that only persons holding degrees recognised by the General Medical Council in this country might be selected for the Indian Medical Service.—Mr. WEDGWOOD BENN replied: I have not yet received the Government of India's views.

Lieut.-Colonel FREMANTLE asked Mr. Benn to do everything he could to insist that in any such change of rules there would be no degradation of the service that had done so much and was expected to do so much by keeping its standard up to the European standard.

Mr. BENN: I can make no statement until I have seen the views of the Government of India.

TUESDAY, JULY 22ND.

Poison Gas Experiments with Animals.

Mr. FREEMAN asked the Secretary of State for War what evidence he had, and how it was obtained, that the experiments conducted at Porton of poison gases on animals showed that those gases had the same effects on human beings.—Mr. T. SHAW replied: A comparison of the gross and microscopic appearance of the lungs of men killed by irritant gases in France with those of animals exposed to the same substances showed that the injuries were of similar nature and character, and further study of such animals gave evidence of the mode of action of the poisons and their effects on vital organs. It was thus possible by correlating these experiments with clinical observations on gas patients to formulate curative treatments. Descriptions and results of this research were published in the medical press shortly after the war.

Calmette Prophylactic Treatment.

Mr. FREEMAN asked the Minister of Health whether he was yet in a position to state the result of the inquiries of the representatives of the Medical Research Council into the death of 20 infants in Lübeck, Germany, following the Calmette prophylactic treatment.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: No, Sir. My right hon. friend has no information at present beyond that contained in the answer given to my hon. friend on the 8th instant.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 12TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 138 (last week 156); scarlet fever, 1776; diphtheria, 1287; enteric fever, 85; pneumonia, 533; puerperal fever, 39; puerperal pyrexia, 86; cerebro-spinal fever, 13; acute poliomyelitis, 11; acute polioencephalitis, 3; encephalitis lethargica, 16; dysentery, 8; and ophthalmia neonatorum, 107. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 15th–16th was as follows: Small-pox, 229 under treatment, 4 under observation (last week 281 and 11 respectively); scarlet fever, 1773; diphtheria, 2003; enteric fever, 32; measles, 326; whooping-cough, 75; puerperal fever, 27 (plus 13 babies); encephalitis lethargica, 121; "other diseases," 19. At St. Margaret's Hospital there were 13 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 1 (0) from enteric fever, 18 (5) from measles, 7 (0) from scarlet fever, 11 (4) from whooping-cough, 27 (3) from diphtheria, 44 (12) from diarrhœa and enteritis under two years, and 16 (1) from influenza. The figures in parentheses are those for London itself.

Five fatal cases of diarrhœa were reported from Birmingham, 4 from Liverpool, and 3 from Hull.

The number of stillbirths notified during the week was 272 (corresponding to a rate of 38 per 1000 births), including 51 in London.

INDEX TO "THE LANCET," VOL. I., 1930.

THE Index and Title-page to Vol. I., 1930, which was completed with the issue of June 28th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NEW YORK STATE WOMEN'S HOSPITAL.—Last year this hospital treated 2527 ward patients at a cost of $6·444 per head per day; private room patients cost $7·698 per day. In-patients of both categories reached a total of 5416, and there were 8315 out-patients. The service for the reception of visitors has been greatly improved by the appointment of a hostess. There were 1609 obstetrical cases, and 1342 babies were born, with a maternal mortality of ·87 per cent. and an infant mortality of 2·64 per cent.

OCCUPATIONAL THERAPY FOR MENTAL CASES.—The report for last year of the medical director of the Bloomingdale Hospital, White Plains, New York, shows that of the 224 patients (110 men and 114 women) who were discharged, 59 were fully recovered, 33 much improved, and 62 improved. The average period of treatment of the recovered was 7 months and 21 days, and of those improved 9 months and 29 days. A considerable number of those discharged are kept under observation by means of visits to the hospital, an arrangement which is found to be "of great value in aiding them to complete their adjustments and to seek early advice in the event of the return of any unfavourable symptoms." All patients whose condition permits go to the occupational therapy buildings for regular periods each day. Over 28,000 articles were made or repaired by them, and in addition the printing office turned out 467,000 pieces of printed matter, including a number of pamphlets of value to the medical, nursing, and therapeutic services. "It is found that the actual accomplishment of some worth-while piece of work gives the best results in this form of treatment."

OBITUARY

HENRY FRASER, M.D. Aberd., M.R.C.P. Lond.

Dr. Henry Fraser, who died suddenly on July 17th, while on holiday at Pitlochry, Perthshire, was born in Aberdeen in 1873, and received his preliminary education there. After a brilliant career as a student of medicine in Marischal College, he graduated M.B., Ch.B. from the University of Aberdeen in 1900. He was awarded the Anderson Research Scholarship, and in the two years following graduation studied pathology at Berlin and Halle. On his return to Aberdeen he proceeded to the degree of M.D. and the D.P.H., in 1902.

Fraser's inclination was towards the investigation of disease rather than medical practice. By reason of his training in pharmacology, chemistry, and pathology he was specially well equipped for laboratory research. In 1906 he was chosen by the Colonial Office to succeed C. W. Daniels as Director of the Institute for Medical Research, Federated Malay States. During the ten years he occupied this post, Fraser made a series of valuable contributions to the study of tropical diseases; his researches in beri-beri, bacillary dysentery, and leprosy gained for him an international reputation. On his retirement from the Colonial service in 1916, he served in the Royal Army Medical Corps, first at Malta, and later at Salonica. After the war he was engaged in the Ministry of Pensions service in London and Birmingham as a consultant in tropical diseases. In consequence of impaired health he retired from active work a few years ago, and latterly he lived quietly at Leamington Spa. In 1926 he was admitted M.R.C.P. London.

Fraser was one of a distinguished group of pathologists trained at the University of Aberdeen under the inspiring influence of Prof. Hamilton. His work in the tropics received less in the way of formal recognition than was its due, but his name will be held in high honour by the colleagues who were privileged to be associated with him there. He would, perhaps, desire no other memorial.

HECTOR G. G. MACKENZIE, D.S.O., M.D. Durh.

THE death occurred suddenly on Saturday, July 19th, of Dr. Hector Mackenzie at his flat in West Kensington.

Hector Graham Gordon Mackenzie was educated at Winchester and the universities of Oxford, Edinburgh, and Durham. He graduated in Arts at Oxford in 1897, and at Edinburgh was demonstrator of physiology in Surgeons' Hall. In 1907 he graduated in medicine at the University of Durham, proceeding to the M.D. degree in 1913. His first medical appointments were in connexion with tuberculosis, and he was for a time house physician to the Brompton Consumption Hospital and assistant tuberculosis officer at Charing Cross Hospital. He was known publicly for his deep interest in boys' clubs, and many social workers are aware of the scheme which he projected for the development of medical control in these institutions. His views on the subject were published in a pamphlet entitled "Medical Control in a Boys' Club," while the practical experience which led him to form these views was gained as medical officer to the Hollington Boys' Club, with which he was connected for many years; he was also honorary medical officer to the Secondary Schools Camp Association. He was deeply attracted by the problems allied to medicine which arise out of the study of many aspects of mental healing, and wrote on this subject generally, and also on the influence of treatment at Lourdes.

During the war Dr. Hector Mackenzie was very active on more than one front in ambulance service, and attained the rank of Lieut.-Colonel R.A.M.C. He was widely known to a large circle of patients and friends, and, as will be gathered from this brief record, possessed a fertile mind and an enthusiasm for social causes.

PHILIP BRUNELLSCHI COUSLAND, M.B. Edin.

Dr. P. B. Cousland, who died in British Columbia on July 7th, was for many years editorial secretary of the Chinese Medical Translation Committee, and took an important part in the development of western medicine in China. Born at Glasgow in 1861, the son of James Cousland, he was educated at George Watson's College, Edinburgh, and Edinburgh University. After being house physician at Leith Hospital he went out to China, under the Presbyterian Church of England and the China Medical Missionary Association, to Swatow Hospital, in 1883. Three years later he transferred to Chaochowfu, where until 1906 he engaged in medical, evangelistic, and other work, including a great deal of translation. He then moved to Shanghai, his services being lent to the China Medical Missionary Association (now the China Medical Association) for the purpose of editing, translating, and publishing medical books in Chinese. He was President of the Association from 1910 to 1913.

"It was in 1890," writes a correspondent, "that Dr. Cousland became a member of the terminology committee of the Association, and the bulk of its work fell upon his shoulders. It largely lay with him to render in Chinese ideas and words wholly foreign to the Chinese language. The ideographs had each to be considered separately by the committee, before they were adopted or improved, and finally used in the work of the translation of foreign medical works in Chinese. The Chinese Government eventually itself took part in this task, and appointed a special committee to deal with the matter, on which the Medical Missionary Committee was represented. He was himself the author of 'English-Chinese Medical Lexicon,' and he translated Osler's 'Practice of Medicine,' Halliburton's 'Physiology,' and Younger's 'Insanity in Everyday Practice.'"

Dr. Cousland was twice married, first to Miss Susan Harrington, and secondly to Miss Ida Rebecca Luther. He retired from active work some years ago and settled at Victoria, B.C., where his younger son is in medical practice.

WORCESTER GENERAL INFIRMARY.—During 1892 there were 1941 admissions, an increase of 160, and the average stay was 19·7 days. New out-patients numbered 5983 (casualties 3366), an increase of 628. The average total cost of each in-patient was £6 11*s.* 11¼*d.*, an increase of 8*s.* 5*d.* upon the previous year, and the cost per occupied bed was £129 4*s.* 10½*d.*, an increase of £12 2*s.* 10½*d.* In its second year the contributory scheme produced slightly more than £9000; the county membership is 11,000, and the Worcester city membership 14,000. It has been decided to raise the number of beds from 118 to 150, with a further increase to 200 as means become available.

MEDICAL NEWS

University of London.

At a meeting of the Senate on July 16th Dr. Samson Wright was appointed to the university chair of physiology at Middlesex Hospital Medical School.

Dr. Wright was formerly a student of this school and qualified in 1920. He graduated as M.D. Lond., and became a Member of the Royal College of Physicians in 1925. At the Middlesex Hospital, besides holding clinical appointments, he was formerly senior demonstrator of physiology, but since last autumn he has been lecturer in physiology at King's College. His original work has followed several branches of applied physiology and his text-book on this subject is familiar to advanced students.

The title of Professor was conferred on Dr. J. G. Thomson (Medical Protozoology), and Dr. G. S. Wilson (Bacteriology as applied to Hygiene), in respect of their posts at the London School of Hygiene and Tropical Medicine.

Mr. Alexander Robertson, Ph.D. Glasg., was appointed to the university readership in biochemistry, tenable at the London School of Hygiene and Tropical Medicine.

It was resolved to institute a university chair of radiology, tenable at the Cancer Hospital, Fulham-road, S.W.

The degree of D.Sc. has been conferred on Mr. R. K. Cannan and Mr. S. A. Mann (Biochemistry) and on Miss May Smith (Industrial Psychology).

The Senate have resolved to institute a Diploma in the Theory and Practice of Physical Education.

University of Edinburgh.

At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., CH.B.

N. J. Abbensetts, A. Amdor, A. J. Bain, B. Berger, James Black, D. M. Blair, A. B. Brereton, A. Brookner, G. J. F. Caley, A. C. P. Campbell, M. Chamurich, D. S. Clark, P. de Beer Clark, W. S. M. Craig, S. Davidson, J. S. de S. Drummond, E. H. Duff, S. Eisenhammer, W. R. de Faria, M. H. Finkelstein, G. S. Forrester, A. K. Fraser, E. M. Fraser, P. Fraser, D. N. Gibbs, J. C. Gibson, J. J. Glover, F. G. Goulder, M. C. Gray, James Guthrie, J. A. Guy, S. Harwitz, A. G. Hill, C. H. Howat, G. J. Hugo, J. L. Hunter, J. C. A. Hunter, E. R. Jamieson, J. M. Jamieson, T. T. Jardine, J. S. Jeffrey, H. M. Johnston, R. Y. Keers, P. L. Lai-Fook, J. S. Lawrence, E. Lazarus, E. Seng Lee, M. J. Leiserowitz, M. A. Lockie, J. M. MacAlister, A. L. Macdonald, A. Macdonald, C. R. Macdonald, S. A. Macdonald, John Mackenzie, A. F. Mackenzie, C. Mackie, A. W. Mackinnon, J. M. MacLennan, P. A. Macleod, K. J. E. MacMillan, W. M. Martin, A. E. Milne, J. M. Modak, I. C. Monro, W. I. C. Morris, H. L. Morrison, I. H. C. Morton, R. B. Nelson, H. J. Newlands, J. A. Noble, J. M. Officer, D. Orr, H. O. Parkinson, M. E. Paterson, J. P. Pennybacker, H. A. Raeburn, P. L. J. C. Ransome-Wallis, R. A. Read, R. L. Renwick, A. N. Roxburgh, U. Schutzer, H. G. Scott Kerr, W. C. Service, T. I. Sibbald, I. H. Silverstein, D. W. G. Smith, C. N. T. Spowart, D. G. A. Stewart, H. Stewart, J. L. Swanston, A. Thomson, T. B. Tibbetts, J. S. Tough, G. Turner, R. E. Verney, L. S. Wakefield, E. S. Walker, R. Walmsley, George Watt, E. J. Welford, A. D. Wilson, T. T. B. Wood, and J. Yunibandhu.

Royal College of Surgeons of Edinburgh.

At a meeting of the College on July 22nd, with Dr. James Haig Ferguson, the President, in the chair, the following 22 successful candidates (out of 73 entered) who passed the requisite examinations between March 27th and April 4th, were admitted as Fellows:—

Mahmoud Ismail Ashmawi, Percy Charles Edward Brunette, Conal Charleson, Arthur Charles Copley, Arthur Brython-Davies, James Dick, Colin Archibald Ferguson, James Paton Galloway, Douglas Medlicott Gibson, Thomas Jordan Gibson, Austen Henry Holmes, John Black Hutchison, Calverley Middlemiss Jennings, Lekhraj Rochiram Lalwani, Alistair Campbell McEachern, Hamish Falconer Masson, John Wright Nankivell, Harold Keith Pavy, William Bernard Roantree, Eric Thomas Sutherland Rudd, Peter Dewar Thomson, and Alister Laird Young.

The Ivison Macadam memorial prize, consisting of a bronze medal and a set of books, was, after a competitive examination in organic chemistry, awarded to Mr. Eng Tay Oon.

Royal College of Physicians of Edinburgh.

A quarterly meeting of the College was held on July 15th, with Sir Norman Walker, the President, in the chair. Lieut.-Colonel W. F. Harvey and Dr. Arthur Oliver Gray were introduced and took their seats as Fellows. Dr. H. L. Wallace (Edinburgh), Dr. William Brown (Aberdeen), and Dr. H. E. Whittingham (Halton, Bucks) were elected to the Fellowship.

It was announced that Dr. D. K. Henderson, of Glasgow, had been appointed Morison lecturer for 1931.

Ulster Medical Society.

The following office bearers have been elected for the session 1930–31: President: Mr. Henry Hanna. Vice-Presidents: Prof. C. G. Lowry, Dr. Craig (Bangor). Secretary: Dr. J. A. Smyth. Assistant Secretary: Dr. F. P. Montgomery. Treasurer: Dr. F. M. B. Allen, Librarian: Dr. S. Simms.

A Course in Surgical Tuberculosis.

Under the direction of Dr. Etienne Sorrel a course in surgical tuberculosis and orthopædics will be held at the Hôpital Maritime de Berck Plage, Pas-de-Calais, from August 4th to 16th. Particulars may be had from Dr. Delahaye at the hospital.

Ross Institute and Hospital for Tropical Diseases.

A meeting was held at the institute on July 9th, when the annual report and accounts of the institute for 1929 were presented (see THE LANCET, May 3rd, 1930, p. 976). Sir Charles McLeod, who presided at the meeting, said that the institute had made substantial progress during the past year under the general direction of Sir Ronald Ross, who spent all his time there. The institute had become known as a prominent centre of research in the field of fungi and fungal diseases. The malaria department had helped both doctors and laymen with advice on antimalarial work, and visits had been paid by members of the institute to Rhodesia and South Africa. An important development since the annual report was published was the opening of a branch of the Ross Institute in Assam to carry out scientific and practical work on the prevention of malaria in Assam and parts of Bengal. Dr. G. C. Ramsay had been appointed director of this institute, and certain firms connected with local industries had agreed to finance it for three years. Dr. R. Mhatre expressed appreciation of the facilities given to visiting doctors to work at the Ross Institute.

Eleventh International Veterinary Congress.

This congress will be held at the Central Hall, Westminster, London, S.W., from August 4th to 9th. The official programme has now been issued. Twenty-six countries will be represented, and the discussions will cover a wide range. General meetings will be held in the mornings and will include discussions on foot-and-mouth disease, tuberculosis, infectious abortion, the relationship of the veterinary surgeon to animal husbandry, veterinary science in relation to public health, and the law governing the practice of veterinary medicine and surgery. In the afternoons sectional meetings will be held on variola in domestic animals; the use of drugs in the treatment of diseases caused by worms; theileriases; fowl typhoid and bacillary white diarrhœa; anthrax; swine fever; milk fever; fowl-pox; genetics; rabies; standardisation of biological products; acute infectious mastitis; control of trypanosomiases; deficiency diseases; black-leg; scientific feeding of animals; distemper; bovine sterility; rinderpest; treatment of parasitic diseases; diseases of the new-born; and fowl plague. Besides the scientific meetings a full programme of social functions has been arranged, and the delegates will be entertained by H.M. Government and by the Corporation of the City of London.

London School of Hygiene and Tropical Medicine.

A reception was given by the School at its new buildings in Gower-street on Friday, July 18th, to welcome members of the Colonial Office Conference. The guests were received in the library of the building by the chairman of the board of management, Sir Harry Goschen, and Lady Goschen, by the chairman of the court of governors, Sir Holburt Waring, and Lady Waring, by the vice-chancellor of the University of London, Sir Gregory Foster, and by the Dean, Prof. W. W. Jameson, in the absence of Sir Andrew Balfour, who was unable to be present. H.R.H. Prince George was among the guests. A series of scientific exhibits was shown in the library by members of the staff of the School; there were technical demonstrations in the various laboratories; and an interesting lecture was given to a large group of the guests by Dr. P. A. Buxton on the modern developments of medical entomology. Other guests had an opportunity to see a fine cinema display in the main theatre, illustrating scenes from primeval life, the emergence of man as leader though pitted against formidable monsters, the fight to-day of man against a myriad of microscopical foes; and school life at the special schools of the Leyton Urban District Council. A large number of guests enjoyed the hospitality of the School.

University of Liverpool.

Dr. W. J. Dilling has been appointed professor of pharmacology.

Hospital Sunday.

Up to July 19th the amount received from the collections on London Hospital Sunday was £68,000.

World League for Sexual Reform.

The fourth congress of the World League for Sexual Reform on a Scientific Basis will be held in Vienna from Sept. 13th to 20th. The address of the organising committee is Postfach 63, Vienna I/15.

A Course on Radium.

Under the auspices of the University of Birmingham a post-graduate Course on Radium Therapy will be held at the General Hospital, Birmingham, from Sept. 22nd to Oct. 4th. Particulars will be found in our advertisement columns.

Harton Poor-law Institution.

The Ministry of Health recently held a local inquiry into complaints concerning the administration of this institution which now belongs to South Shields town council. In stating his findings the Minister says that the evidence suggested that there has been a certain laxity in administration, that no one in the hospital appeared to be definitely responsible for summoning a doctor to the receiving wards, and there was no visible indications there that a doctor was available and on duty. His general conclusion is that there is need for closer supervision.

Royal National Orthopædic Hospital.

Last year 354 in-patients were admitted, and their average stay was 275 days; their average weekly cost was £2 2*s*. 11*d*., with a total per head of £84 3*s*. 11*d*. In addition, 9253 out-patients were treated. The number of patients exceeded all previous totals, and further clinics have been established in various parts of the country in coöperation with the local authorities.

Dumping of London Refuse.

On July 17th Miss Susan Lawrence, Parliamentary Secretary to the Ministry of Health, received a deputation from Essex riverside local authorities affected by dumping of refuse from Greater London.

Mr. H. T. Muggeridge, M.P., spoke of the danger to health inherent in the present practice of forming huge, unsightly, and insanitary dumps in the areas bordering on London. An inter-party committee of Members of Parliament had been formed to press for immediate action. This committee welcomed the recommendation of the Departmental Committee on London Cleansing that there should be a central responsible body, but regretted that continuance of the present method of dumping was contemplated. If, however, dumping in some form must continue, then local authorities should have the right to veto the sites proposed, subject to appeal to the Minister. Mr. F. J. Cole, chairman of Hornchurch Urban District Council, said that the dumps fostered the breeding of rats and flies, and were a grave menace to the public health. The local authorities had little or no control over them. They wished to press for legislation prohibiting further dumping except with permission, and under the control, of the local authorities in the districts affected, any cost incurred by this supervision to be borne by the dumping authority or its contractors. The position had been acute since about 1922 when rapid development of the area began.

Miss Lawrence said she had herself been over one of these dumps, and she thought their existence was a public scandal. But she thought the local authorities had not yet made full use of their existing powers. They could proceed (1) under the nuisance provisions of the Public Health Act, and (2) under the power to make by-laws and obtain continuing penalties for infringement. Hitherto, so far as she was aware, no Essex authority had made by-laws on this subject. Some other areas had done so, and enforcement of the by-laws had resulted in improvement of the conditions. As to legislation, it was not only a question of the merits of the case; there was the very great difficulty that the committee had not been able to agree on the constitution of the central authority. This meant that any legislation was likely to be controversial, and the difficulty of finding Parliamentary time would be correspondingly greater. The Minister proposed to take up with the borough councils the committee's recommendation that dumping authorities should be pressed to discontinue the use of insanitary dumps for their refuse, and take measures to minimise the unsatisfactory conditions. Mr. Oldfield said that procedure by nuisance was useless because it presupposed a dump. Procedure under by-laws was far more promising. It would be more effective if higher penalties were provided, and if the courts had power to prohibit recurrence of the nuisance.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—McRobert Lecturer in Malignant Disease. £800.
Accrington, Victoria Hospital.—Hon. Anæsthetist.
Altrincham General Hospital, Cheshire.—Sen. H.S., and Jun. H.S. At rate of £150 and £120 respectively.
Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.
Barnsley, Beckett Hospital and Dispensary.—H.P. £140.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Bath, Royal United Hospital.—H.P. and Asst. H.S. Each at rate of £120.
Birmingham, Midland Hospital, Easy-row.—H.S. £200.
Birmingham Univ.—Walter Myers Travelling Studentship. £300.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120. Hon. Clin. Asst. to the Dermatological Dept. Also Hon. Med. Clin. Asst.
Bristol Royal Hospital for Sick Children and Women, St. Michael's Hill.—H.S. £125.
Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £75.
Chester County Mental Hospital.—Jun. Asst. M.O. £350.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100-£175.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Coventry and Warwickshire Hospital.—Two Res. H.S.'s. £150 and £125.
Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.
Doncaster Royal Infirmary.—Three H.S.'s and one H.P. All at rate of £200.
Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.
Eastbourne, Princess Alice Memorial Hospital.—Jun. H.S. At rate of £100.
Evelina Hospital for Children, Southwark, S.E.—H.S. Also Cas. and Out-patient O. Each at rate of £120.
Glasgow Univ.—Samson Gemmell Chair of Medical Pædiatrics.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. Also H.P. At rate of £175 and £135 respectively.
Grosvenor Hospital for Women, Vincent-square, S.W.—Res. M.O. At rate of £100.
Hertford County Hospital.—H.P. At rate of £150.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Huntingdon County Hospital.—H.S. £125.
Indian Medical Service.—Commissions.
Kingston-upon-Hull, City and County of.—Res. M.O. for City Hospital, Cottingham. £350.
Leeds Jewish Herzl-Moser Hospital.—Res. M.O. £100.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool Heart Hospital.—H.P. £52.
London School of Hygiene and Tropical Medicine.—Research Studentships in Entomology and Protozoology. Each £250.
Manchester, Ancoats Hospital.—H.P. At rate of £100.
Manchester, City of.—Jun. Res. Asst. M.O. At rate of £275.
Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Hon. Asst. Surgeon for Children.
Manchester Victoria Memorial Jewish Hospital, Cheetham.—Sen H.S. £250. Also Jun. H.S. At rate of £125.
Manitoba University.—Professor and Asst. Professor of Anatomy. $5000 and $3500 respectively.
Margate and District New General Hospital.—Res. M.O. £125.
Middlesbrough, North Ormesby Hospital.—H.P. £120.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. £150.
Newark General Hospital.—Res. H.S. At rate of £175.
Newport, Mon., Royal Gwent Hospital.—Hon. Radiologist.
Queen's Hospital for Children, Hackney-road, E.—Cas. O. £100.
Reading, Battle Hospital.—Asst. Res. M.O. £300.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Royal Northern Hospital, Holloway, N.—Res. Out-patient Cas. O. and Anæsthetist. At rate of £70.
Saint Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—Res. Surg. O. At rate of £150.
Salford, Hope Hospital.—Res. Surg. O. £400.
Sheffield National Radium Centre.—Medico-Physicist. £600-£800.
Sheffield Royal Hospital.—H.S. to Ear, Nose and Throat Dept. Also Res. Anæsthetist. Each at rate of £80.
Sheffield Royal Infirmary.—H.S. At rate of £80.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.
Southampton Borough Hospital.—Res. M.O. £350.
Swansea General and Eye Hospital.—Asst. Path. £400–£500.
Taunton and Somerset Hospital.—Jun. H.P. At rate of £100.
Truro, Royal Cornwall Infirmary.—H.S. £170.
Ventnor, Isle of Wight, Royal National Hospital for Consumption and Diseases of Chest.—Asst. Res. M.O. At rate of £300.
Walsall General Hospital.—Cas. H.S. At rate of £120.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—Jun. H.P. At rate of £100.
Wigan Royal Infirmary.—H.S. At rate of £150.
Willesden General Hospital, N.W.—Jun. H.S. £175. Also Registrars.
Windsor, King Edward VII. Hospital.—H.S. At rate of £100.
Wolverhampton Royal Hospital.—Cas. O., and Res. Anæsthetist. At rate of £125.
Wrexham and East Denbighshire War Memorial Hospital.—Res. H.S. At rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Linslade (Buckinghamshire), Stockton-on-Tees (Co. Durham) Wainfleet (Lincolnshire).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workman's Compensation Act for the Districts of the Middlesbrough, Stockton-on-Tees, Stokesley, and Guisborough County Courts (Circuit No. 2). Applications should reach the Private Secretary, Home Office, Whitehall, London, not later than August 9th.

NOTES, COMMENTS, AND ABSTRACTS

THE EXHAUSTED CHILD.*

BY RICHARD C. CLARKE, O.B.E., M.B. BRIST., M.R.C.P. LOND.,

HON. PHYSICIAN TO THE BRISTOL ROYAL INFIRMARY AND HON. CONSULTING PHYSICIAN TO THE BRISTOL ORTHOPÆDIC HOSPITAL.

EXHAUSTION and its effects on children have been occupying my attention for some years, and it is my opinion that the exhausted child is a far commoner phenomenon than it used to be, and that the condition is most insufficiently recognised by our profession, by parents, and those to whom we entrust our children for education and upbringing.

It is a condition which shows well-marked physical signs which depend upon the general muscular atony both of the voluntary and involuntary muscles. The intensity of these signs depend upon the degree of muscular atony, and the signs are found at all stages of development in different cases. The most obvious and dramatic is that stance which is best described as "the child standing over itself." In fact, it maintains its upright position by the bony and ligamentous system rather than by muscle tone (Fig. 1). Other signs are hyperextension of the elbow (Fig. 2), which is best seen if the child is told to stand up with its arm extended. The hand takes up a position of extension of the fingers and flexion of the wrist (Fig. 3), and the scapular wing is prominent. In advanced cases the face is expressionless, though grimacing is not uncommon in slight cases. The abdomen is protuberant and the abdominal wall atonic.

FIG. 1.

Stance of exhaustion.

SYMPTOMS.

The Nervous System.—The nervous system dominates the picture, and Dr. H. C. Cameron in his classic, "The Nervous Child," and his other admirable writings on the subject, defines the stance that I am referring to as occurring only in the nervous child. It is perfectly true that the majority are the active-brained, active-bodied type of child, difficult to manage, wayward with an undue amount of negativism, and that they are emotional and introspective, but this is not true of all of them. My own view is that amyotonia is more a symptom of exhaustion, and that it may be produced by exhaustion in any given child, though the margin of error differs enormously with the individual child. Pyrexia is very common in these children. Some show undue pyrexia in trivial infections, and others run evening temperatures for which no cause can be found.

Cardiovascular System.—The symptoms referable to the cardiovascular system are common and important, and depend on the atony of the autonomic nervous system. They consist of pallor and frequent fainting attacks, symptoms associated in the public mind with anæmia and heart disease. The impulse of the heart beat is often heaving and diffuse, and the rate rapid. Accentuation of the first and second sounds and even systolic murmurs may be present. There is often well-marked sinus arrhythmia and there may be even extrasystoles. A further sign of vasomotor instability is the so-called "orthostatic" albuminuria.

Respiratory System.—Although I know that I differ from some observers, I do not think that this type of child suffers more from catarrh of the respiratory system than do other children.

FIG. 2.

Hyperextension of elbow.

Alimentary System.—Anorexia and capricious appetite are common, but more referable to the nervous system. These children, as has been pointed out by several observers, are specially liable to attacks of vomiting, so-called bilious attacks, which may be so severe as to pass on to true cyclical vomiting, a rare disease in my experience All sorts and types of dyspepsias are common, and a coated shiny tongue is the rule. Constipation, varied by attacks of diarrhœa, is common, and abdominal tenderness—most often over the splenic flexure—is often found.

Genito-urinary System.—I have already referred to the orthostatic albuminuria. Nocturnal enuresis, which is always a neurosis, is very common and sometimes intractable. In one child that I took into hospital for observation the bladder was often found half-way up the abdomen without any symptom or cause.

DIFFERENTIAL DIAGNOSIS.

Subacute Rheumatism.—These children are introspective, and make the most of their aches and pains. What child has not from time to time pains in the limbs? This is frequently mistaken for subacute rheumatism. It is not at all difficult to read into the physical signs indications of chronic rheumatic carditis. Dr. Carey Coombs [1] has called attention to the doubtful case, and although he himself is unlikely to go wrong in the matter, I think he runs the risk of misleading the ordinary practitioner when he says: "An increased area of impulse in itself, without alteration of the sounds commands respect," and he suspects "accentuation of the first sound at the apex or the second sound at the pulmonary base."

FIG. 3.

Extension of fingers.

Dr. Reginald Miller [2] has tried to rope this type of child into the rheumatic net, and seems to regard at

*A paper read before the Bristol Medico-Chirurgical Society.

[1] Brit. Med. Jour., 1930, i., 227. [2] Ibid., p. 230.

any rate a good proportion of them as cases of latent chorea. My view is the opposite; a child who has had chorea is always exhausted, and will conform to this type, but only the smallest proportion of these children are cases of chorea. It is well known and unarguable that rheumatic affections of the heart are very uncommon in the nurtured classes; any public school doctor would bear this out. In a secondary school for middle-class girls, I have examined and re-examined 1767 girls; of these at least 15 per cent. are of the grossly atonic type, and a further 20 per cent. show signs in a lesser degree, yet there have been only seven cases of rheumatic heart, an incidence of 0·4 per cent. This atonic type is lamentably common among the very well-to-do, and some of the worst cases are among the only children of the very rich. If these cases were really rheumatic in origin, surely there would be more rheumatic hearts amongst them.

Alimentary System.—The three favourite diagnoses are mesenteric glands, chronic appendicitis, and intestinal toxæmia. If the patients fall into the hands of the surgeon they seldom get away with their appendix intact, and are lucky if they escape without a pleat in their cæcum, a hitch in their transverse colon, or even a short-circuit in their alimentary tract.

Respiratory System.—The most frequent diagnoses are unhealthy tonsils and mesenteric glands. The latter is a harmless diagnosis, as the surgeon has not yet penetrated into this area, and the usual treatment of rest and hygiene is most beneficial. In the former there is more danger, and the plain man is here in a difficult position. There can be no doubt that an unhealthy tonsil is a danger, and should be removed; but what is a healthy tonsil? The current medical press produces mental confusion, and I do not believe that the ordinary rhinologist would admit that there is such a thing as a healthy tonsil over the age of 5. Enlargement of the tonsillar gland in the anterior triangle of the neck, if it be a test of unhealthy tonsils, is almost universal in children over that age. I am always glad when these children have had their appendix and tonsils out already, as it clears the air considerably.

Some gravitate to the orthopædic department of hospitals and remedial classes in schools, where they are treated with exercises. A great many orthopædic departments have realised the necessity of rest as an adjunct, though some have not. Exercises and re-education to the exhausted child are often just an additional burden.

THE GROUNDS FOR THE EXHAUSTION HYPOTHESIS.

I regard the symptom-complex as being produced only by exhaustion, mental or physical or both, and all treatment should be directed along these lines. The conclusion is the result of my observations in the nursery and in the hospital, of school-children and of parents.

Observations in the Nursery.—Anyone with a nursery will agree that the child who has been over-excited, has had too much pleasure, and is overtired, displays some or all of the symptoms that I have mentioned. Night terrors and nocturnal enuresis can be produced in most children by a game of bears before going to bed. It is a commonplace that after a party the child is difficult to manage, and all the tact is needed to prevent a "scene." Children differ very much, but every child has what is called a breaking-point. If carefully observed round Christmas-time, and after too many parties, a child can be seen to be adopting the typical stance.

In Schools.—In examining the girls of the secondary school, I have invariably noted the position, and recommended early bed, no homework, and a rest in the dinner hour for those with the atonic stance; parties and cinemas are forbidden, and no remedial exercises are done. Where these instructions have been carried out, the improvement has been invariable and sometimes dramatic, but where parents have not coöperated the results have been negligible.

In Hospitals.—I have from time to time admitted the most advanced cases for investigation, and have put them "through it," to find some organic cause for the disorder, invariably with a negative result. Nevertheless considerable improvement has always taken place, the result, no doubt, of physical and mental rest. Recently I have been admitting such cases for the sake of the rest only, with the most satisfactory results.

Parents and Families.—In my experience, the worst cases of exhaustion occur in the only children of anxious parents, and when I have had the opportunity of seeing the family it has been the eldest that stands worst. "The only son of his mother, and she was a widow," is perhaps the most intractable case of all. The sole explanation of the only and eldest child phenomenon is that it is never left alone, it is watched day and night, fussed over, and "brought up"—in the worst sense of the word. The alternative explanation, that only the eldest child is nervous, is improbable on the face of it.

WHY ARE CHILDREN EXHAUSTED?

It must be either that the modern child is more easily exhausted and can stand less than his parents, or that modern methods of upbringing and education are all wrong. The former view was put to me very strongly by the headmaster of a great public school in the course of a conversation, but one must always accept this view with reserve. It has been said by every generation since the Stone Age, and we all suffered from it in our youth. None of us think "that our house physicians and clerks know what it is to work as we did." Of course, the war is a common excuse of parents with this type of child. There can be no doubt that the parents of children of present school age were profoundly affected by the late war, no matter what part they were called upon to play in those stupendous times. Whether this could be a factor or no, I must leave to the expert biologists to argue and decide. I myself have an open mind on the matter, but if it be so it cannot be altered, and it simply means that the second factor, the upbringing and education, needs to be modified. My own opinion is that the blame lies entirely with this second factor. The modern child, from infancy upwards, leads far too strenuous a life. In the nursery it is "infant-welfared" from morning till night, it is surrounded with complicated toys and complicated picture-books designed to overtax its brains. In these days of motor-cars, even the street is an adventure.

In education parents pay the piper and the pedagogue calls the tune. Clifford Allbutt uttered many warnings against the cramming system of schools from the nineties, onwards, and since the war Sir Humphry Rolleston has continued the good work, but these are voices crying in the wilderness. We may take it as a fact that every pedagogue will overwork a child if he or she possibly can. Fortunately, most boys put up a defence, but girls, being more conscientious, are easier victims. Since the war the efficiency, in all schools—elementary, preparatory, secondary, and public—has been increased, and this increased efficiency has done away with the old type of pedagogue who, although he may have taught us nothing, at least rested our brains. May it not be that the nerves of the modern child are being sacrificed to efficiency and competition, though the general standard of education may be immensely higher?

TREATMENT.

The treatment of this condition can be summed up in one word: "rest," mental and physical. Directly the child is observed to be standing badly its burden must be lightened, any gross disease must be treated, tonsils, if really unhealthy, must be removed, errors of refraction must be corrected, and the teeth must be put in order. The whole system of Upbringing with a capital U, must be gone into and modified, and school work adjusted to the child's capacity. Early bed, midday rests, no parties or cinemas in term time, and as quiet a life as possible are all obvious precautions. Some of these measures may lead to

clashes with parents or pedagogue, but they must be insisted upon. In a really bad case I start the treatment with confinement to bed for a month. Much has been written by Dr. Cameron and his co-workers at Guy's lately with reference to diet; suffice it to say that these children take fats badly, and that eggs, cream, and cod-liver oil—so frequently ordered—are most unsuitable and most provocative of so-called bilious attacks and cyclical vomiting. The most suitable diet is mainly carbohydrates, with the addition of glucose. I have been trying glucose now for some years on these children, and am highly satisfied with the results. A cocktail containing glucose, soda bicarbonate, and potassium bromide, taken before a party, has given most excellent results.

CONCLUSIONS.

1. Amyotonia in children is a condition accompanied by well-marked physical signs and symptoms.
2. Although the majority of these children are inherently nervous, some are not.
3. The condition is produced by exhaustion, mental and physical.
4. It is curable by mental and physical rest.
5. It is a common condition in all classes, and is becoming commoner.
6. The standing position of any child is the most important clue to its mental and physical health.

THE DUTCH PESSARY.

To the Editor of THE LANCET.

SIR,—In the annotation on Birth Control in your last issue you refer to the difference in size of the Dutch pessaries used at different clinics in this country. I began using this pessary just nine years ago, and introduced it to the profession at a congress held in 1922. (See THE LANCET, 1922, ii., 195.) I have used it in several thousand cases since then, and kept many of my patients under regular observation for periods varying up to as much as nine years. The pessary is made in 19 (not 14) different sizes, varying from 45 mm. to 90 mm. diameter, and I began nine years ago by using large sizes—seldom below 70 mm. But greater experience soon taught me that these sizes were too large for most women. They are so big that they must lie *very* obliquely in the vagina, and any increase of intra-abdominal pressure is likely to dislodge them so that they come to lie longitudinally in such a way that they no longer occlude the vaginal vault at all. For many years now I have used much smaller sizes, usually from 55 to 70, sometimes from 50 to 55, and rarely below 50 or above 70—and have got much more satisfactory results.

Mrs. Florence, in her careful study of 247 cases from the Cambridge clinic, classes 155 as failures. But of these 155 only 16, at most, are failures of the contraceptive to prevent conception; and Mrs. Florence herself says that she suspects 4 of these 16 of not having carried out full instructions. The other 139, for one reason or another, did not use the method, and therefore, obviously, cannot be counted as failures. The methods advised were certainly successful, *when used*, in 76 cases out of 92—i.e., in 82·6 per cent., so that Mrs. Florence's pessimism seems a little exaggerated. It is probable that the sizes recommended at the Cambridge clinic are, on the average, too large—rather than too small as you suggest.

I have frequently seen women who had been fitted by other qualified practitioners with pessaries so much too large as to be uncomfortable and unreliable. Indeed, in many cases the pessary could not be wholly inserted into the vagina at all, but protruded from the orifice. Perhaps the blame for this partly belongs to me, because formerly I advised as large a size as would lie in the vagina without causing discomfort. I therefore take this opportunity of warning against using a size so large that it will not fit properly into the vagina at all, or will only fit so obliquely that it may be dislodged by any ordinary increase of intra-abdominal pressure, or by the passage of fæces through the rectum. Bulging of the rectum, due to extreme constipation, may dislodge even the best fitting pessary. While this pessary is fairly reliable when used alone, its reliability is increased if the patient smears it before insertion with a jelly containing 1 per cent. lactic acid ("Contraceptalene"), and douches next morning before and after removal of the pessary. I have never seen a case in which this method has caused any ill-effects, nor have I been able to trace any such case in the literature.

The intra-uterine ring, to which you refer, has already been proved in one case to be fallible, though, in so far as it requires no care or intelligence on the part of the patient, it represents an advance in technique. I am, Sir, yours faithfully,

Harley-street, W., July 19th, 1930. NORMAN HAIRE.

A PROTEST FROM REGISTERED NURSES.

The Managing Director of the *Nursing Mirror and Midwives' Journal* has written in connexion with the letter under this title in our issue of July 19th, taking exception to an advertisement which appeared in the *Nursing Mirror* on June 14th. The Managing Director says: "This particular advertisement unfortunately slipped through by an oversight, and was published in one issue of the paper. On the morning of publication the management returned an order for further insertions of the same advertisement. On July 8th we received the letter of expostulation from the Royal British Nurses Association. A reply, a copy of which we enclose, was sent to them by return of post. It was not until July 12th that their letter of complaint was sent to you." The letter enclosed contains both an explanation and expressions of regret.

A PAMPHLET ON SPA TREATMENT.

THE Harrogate Medical Society have issued a pamphlet designed for the medical profession on spa treatment in general and on its application in Harrogate. The nature, aims, and methods of spa treatment are discussed and cases suitable for this treatment are indicated. Doctors desiring to send patients to Harrogate will welcome especially the sections on the routine adopted there, the length of visit advised, and the cost of "the cure." The authors of the pamphlet acknowledge that there is a certain amount of scepticism amongst their professional colleagues as to the efficacy of spa treatment, but point out that there are no more confirmed advocates of this particular health régime than medical men who have tried it themselves. The pamphlet and any further information required can be obtained from The General Manager, The Royal Baths, Harrogate.

IN THE MATTER OF AGE-LIMIT.

To the Editor of THE LANCET.

SIR,—It is good science, and should be good politics, to reconsider evidence periodically from as nearly unbiased a point of view as possible, in order that one may check one's beliefs or working hypotheses, whichever one chooses to call them, and perhaps discover new laws or modify old ones to suit the new data. Osler's suggestion of senility at 40 was made as a joke, but in view of much experience in applying for posts in various parts of the British Empire, I find that we are regarded as too old at 40 for most of the public posts, whatever may have been our past experiences, or our admitted suitability for a post. If you will consider the advertisements in your own pages, you will usually find that any post in either a Government or a Local Government service is only open to people under 35 years of age. A few of the higher type are open to those up to 40, but anything over is disqualified. This is said, when one asks why, to be due to the rule that such posts are pensionable, and that one must contribute to some scheme 5 per cent. of one's gross salary—as well as 4s. 6d. in the pound to income-tax—and

that it is expected that one will be able to give at least 20 years' service, otherwise 20 years for 19 years' pay. One is not allowed to waive pension rights, and cover one's own old age pension in one's own way, neither may one, however likely to serve for 20 years, get into the service if over this age-limit. We have succeeded in lengthening our life period considerably, and professional people are presumably of the higher type of mind, and so likely to be useful to the community for longer than the average man of I.Q.100 or so. Why, then, are the experienced to be barred just at the time when they are most likely to serve their community or country best? All honour to the young and enthusiastic, but at least some of us are middle-aged and enthusiastic, and have in addition experience which the young cannot yet have. Is it not now time that these rules for barring the older people were reconsidered and amended to give a chance to all who would serve their community in a public capacity, provided they are well qualified to do so?

I do not sign my name for obvious reasons.

I am, Sir, yours faithfully,

EX-TEMPORARY CIVIL SERVANT.

TYPOGRAPHY.

THE introduction of new founts of type into the pages of THE LANCET, and the general enlargement of the type employed, has led to several inquiries as to the history of the different forms of printing. Anyone who consults the article entitled Typography in the Encyclopædia Britannica will see how special the subject is; the famous founts of France, Italy, Germany, and Holland have in some cases known origins, and certain names, such as those of Plantin and Elzevir in the sixteenth century, are as familiar as the name of William Morris in the nineteenth century in connexion with particularly beautiful designs. In answer to one particular question—what is the type that has been employed in the main headings of the different sections in THE LANCET, we have this information; it is called "Caslon open," and William Caslon, who was among the earliest of the well-known English type-founders, flourished during the first half of the eighteenth century. As an illustration of the loving care with which the early types were made we may quote a note on the subject we have received from the Lanston Monotype Corporation. Speaking of the Italian types of Arrighi and Blado, the note says "these were most probably cut by a famous goldsmith from Perugia, Lautizio de Bartolomeo dei Rotelli, mentioned with commendation by Benvenuto Cellini himself."

THE MEDICINE OF AVICENNA.

To the Editor of THE LANCET.

SIR,—In a note with this title, published in your issue of June 28th, the photograph, as you rightly surmise, illustrates the entry to a tomb; it is that of Avicenna himself, at Hamadan, in Western Persia. I wrote an article in 1913 for the *St. Bartholomew's Hospital Journal* on A Pilgrimage to the Tomb of Avicenna. It led to a scheme for the conservation of the tomb, largely due to the late Sir William Osler. The war put an end to it, but money was collected in Hamadan by the local doctors, and the tomb and little garden were put in order. I saw it in 1920 and have a photograph.

I am, Sir, yours faithfully,

Highate, N., July 6th, 1930. A. R. NELIGAN, M.D.

QUEEN MARY'S HOSPITAL, SIDCUP.—This hospital, which has been purchased by the London County Council, was opened by Princess Mary Countess of Harewood on July 21st. The hospital was formerly the Queen's Hospital for Facial Injuries, and has been expanded to form a convalescent centre for 500 male patients from the Council's hospitals. Mr. Arthur Greenwood, Minister of Health, was present, and Dr. F. Barrie Lambert, chairman of the Central Public Health Committee of the Council, spoke of the reasons why the hospital had been acquired and the use to which it would be put by the Council.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 28th, to SATURDAY, August 2nd.—INFANTS HOSPITAL, Vincent-square, S.W., Special Course in Diseases of Infants. Every afternoon from 2.0 P.M. Lectures and Demonstrations. Further particulars from the Fellowship of Medicine.

Appointments

BRYCE, A. G., M.D., Ch.B. Manch., F.R.C.S. Eng., has been appointed Hon. Asst. Surgeon to the Salford Royal Hospital.

HUME, N. H., M.B., B.S.Dub., Certifying Surgeon under the Factory and Workshop Acts for Brecon.

RENNIE, J., M.D., Ch.B. Aberd., D.P.H., Prof. of Public Health in Sheffield University.

SAVIN, L. H., M.B., B.S., M.R.C.P. Lond., F.R.C.S. Eng., Consulting Ophthalmic Surgeon to the Whipps Cross Hospital.

Bolingbroke Hospital Incorporated, Wandsworth Common: GRAINGER, R., F.R.C.S. Eng. and Irel., Resident Medical Officer; HARDWICK, S. W., M.B., B.S. Lond., House Physician.

London Lock Hospital and Home: HERITAGE, K., F.R.C.S. Eng., Surgical Registrar to the Male Lock Hospital; WILLIAMS, LESLIE, F.R.C.S. Eng., Hon. Surgeon to the Male and Female Lock Hospitals.

Queen Charlotte's Maternity Hospital: HALL, EDITH M., M.D., B.S. Lond., Medical Officer, Antenatal Department; LLEWELYN-JONES, MARGARET, L.R.C.P. Lond., M.R.C.S., Resident Medical Officer, Isolation Block.

Births, Marriages, and Deaths

BIRTHS.

COLLEY.—On July 7th, the wife of R. Colley, M.B., Ch.B., D.O.M.S., The Circus, Bath, of a son.

MILL.—On July 16th, at Wilbraham-place, Sloane-street, S.W., the wife of W. A. Mill, F.R.C.S., of a daughter.

MITCHELL.—On July 11th, the wife of Dr. J. Myles Mitchell, Kingscote, Yeovil, Somerset, of a son.

THORNTON.—On July 13th, at Lisnanagh, Forest Fow, Sussex, to Muriel Thornton, M.B., wife of G. Kennedy Thornton, M.B.—a son.

MARRIAGES.

BURTON—SPARK.—On July 19th, at Bedford, Edward Burton, M.R.C.S., L.R.C.P., to Enid, elder daughter of Mr. and Mrs. Hubert Spark, Chaucer-road, Bedford.

BURTON—WOODROFF.—On July 19th, at St. Mary's, Wimbledon, David Henry Burton, B.Sc., to Dorothy Lilian Woodroff, B.Sc., M.R.C.S., L.R.C.P.

GROSS—FAGGE.—On July 17th, at St. Marylebone Church, William Stovell Gross, M.D., M.R.C.P., to Alice Bell Metcalfe, eldest daughter of Charles H. Fagge, M.S., F.R.C.S., and Mrs. Fagge, of Devonshire-place, W.

WILLIAMS—THWAITES.—On July 17th, at the Parish Church, Aspenden, Dr. A. Gregson Williams to Marjorie Patience, eldest daughter of Mr. and Mrs. J. K. Thwaites, of Aspenden Lodge, Buntingford.

DEATHS.

ASHWORTH.—On July 11th, at Worthing, James Henry Ashworth, M.D., late of Halstead, Essex, aged 82.

DYKES.—On July 15th, at Riselaw-crescent, Edinburgh, Thomas Dykes, L.D.S.F.P.S. Glasg., late of Dumfries, in his 75th year.

FRASER.—On July 17th, 1930, suddenly, at Pitlochry, Perthshire, Henry Fraser, M.D., M.R.C.P., aged 56, of Morney, Northumberland-road, Leamington Spa, formerly of Kuala Lumpur, Malay States.

GROGONO.—On July 19th, in a nursing home at Frinton-on-Sea, Dr. R. M. Grogono.

MACKENZIE.—On July 19th, at his residence, Fitzjames-avenue, West Kensington, Hector Graham Gordon Mackenzie, D.S.O., M.D., J.P., Lieutenant-Colonel, R.A.M.C. (T.A.), aged 62.

MIDELTON.—On July 16th, suddenly, Dr. W. J. Midelton, L.R.C.P., M.R.C.S., L.S.A., of Charminster road, Bournemouth, aged 67.

WILLIAMS.—On July 15th, at Spilman-street, Carmarthen, Dr. Edward Richard Williams, M.B.E., aged 70.

WOOD.—On July 19th, at Lodore, Chelston, Torquay, Thomas Outterson Wood, M.D., in his 88th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

SYPHILIS OF THE HEART AND GREAT VESSELS.*

By Carey F. Coombs, M.D., F.R.C.P. Lond.,
PHYSICIAN, AND IN CHARGE OF THE UNIVERSITY CENTRE OF CARDIAC RESEARCH, GENERAL HOSPITAL, BRISTOL.

LECTURE I.

My immediate predecessor in this honourable office permitted himself a brief divagation into the history of the Lumleian lectureship, and brought back for our delectation a very interesting account of its founders. In this account he alluded to a fact which none of us can ever forget; that William Harvey filled this office for over 40 years, and that it was almost certainly in the exercise of its functions that he first proclaimed his views on the circulation of the blood. Whether this is so or not, his influence can be traced throughout the tenure of this lectureship. When its conditions were reconstituted, just over a hundred years ago, its first holder was Peter Mere Latham, who spoke "On Some Diseases of the Heart"; and its second John Elliottson who, though he is unhappily bettter remembered for his adventures in mesmerism, addressed the College "On the recent improvements in the Art of Distinguishing the Various Diseases of the Heart," an art in which he excelled, since he was one of the first British physicians to realise the value of the stethoscope. In more recent times the cardiological flavour imparted by the spirit of Harvey to this lectureship may again be discerned in the contributions of Osler, Norman Moore, Mitchell Bruce, De Havilland Hall, Sutherland, and Horder. To all of these, more or less, I am indebted, and of the first and last in particular I may say that to their lectures on "Angina Pectoris" and "Endocarditis" respectively I owe much of what I have to say in my own. To one other source connected with this College I have also to express my deep indebtedness, and that is to its treasurer, Dr. Sidney Phillips; for it is to his lectures at St. Mary's on cardiac disease, including as they did an unforgettable reference to the liability of the cardiosyphilitic to sudden death, that I owe my first interest in the matter.

But apart from personal reasons this subject has a compelling interest which, I think, justifies my choice. At first sight it may seem presumptuous to claim a territory which marches so closely with those surveyed by some of my immediate predecessors. In spite of this, however, it retains its individuality. It is true that it overlaps such areas as those of intrathoracic aneurysm, angina pectoris, endocarditis, and cardiovascular degeneration, all of which have within the past 20 years provided subjects for these lectures. Yet it is itself an entity, if this word can ever be applied to any group of natural phenomena; and since the progress of science has always been characterised by a derivation of causes from a study of effects, this way of looking at diseases as ætiological entities needs no apology. I propose, therefore, to lay before you an account of syphilis of the heart and great vessels, beginning with a brief survey of the development of our knowledge of the subject. This, together with a consideration of the part which syphilis plays as a cause of cardiovascular disease at the present day, will occupy my first lecture. In the second I propose to attempt a clinical portrayal of the disease, and in the third to expose the anatomical background of this picture, with particular reference to its mode of evolution.

Syphilis and Cardiovascular Disease.

In attempting to trace the growth of a belief in the importance of syphilis as a cause of cardiovascular disease, one is struck by the inexplicable delays which have marked several periods of its development. The association of aneurysm with syphilis was recognised almost as soon as syphilis itself became a common disease. To quote from Sir Humphry Rolleston's [45] Tercentenary Harveian Oration, which has laid all students of cardiology under an unlimited obligation:

> "The traumatic and superficial aneurysm was that mainly seen until syphilis became widespread after the return in 1493 of Columbus from the New World and the occupation of Naples by the army of Charles VIII. in 1495; there was then what has been called an unprecedented occurrence of aortic aneurysm. The association with syphilis did not escape Fernelius, who in 1542 first recognised internal aneurysms; Vesalius, who about 1557 diagnosed both thoracic and abdominal aneurysms; and Ambroise Paré (1582), who incriminated mercurial treatment as a cause of aneurysm. The luetic origin of aneurysm, though accepted by Lancisi (1728) and Morgagni (1761), waned; Matthew Baillie did not mention it in 1789 or later; but it was revived on good grounds in the middle of the last century by Crisp (1847), Myers (1871), Welch (1875) in this country, and by many foreign authors."

Now, during the earlier part of last century certain morbid anatomists described examples of another form of cardiac syphilis; a form so striking that it seems for the moment to have overshadowed the less dramatic aortic lesions that Hodgson [29] figured as preceding the formation of aneurysm. It was in 1845 that Ricord [44] described what appears to have been the first example of cardiac gumma, the exact nature of which was recognised; but not many others were added, and Virchow,[55] in a monumental article on the visceral lesions of syphilis published in 1858, brought forward from his own experience only one example of this lesion, occurring in a man of 47. In the preceding year Wilks[58] had described a case of fibroid heart which he attributed to syphilis, so that interest in the myocardial aspects of the disease had been awakened. Meanwhile, Hodgson and others had given some account of lesions of the aortic valves. As early as 1811 Corvisart[16] had attributed some of these to syphilis, but the lesions as he described them seem to have been polypoid growths of the kind seen in what we now call ulcerative or malignant endocarditis. Possibly they were examples of endocarditis of this type engrafted on a syphilitic basis. At all events the possibility of syphilis as a cause of valvular lesions is not even mentioned by Dominic Corrigan[15] in the paper in which, in 1832, he gave so clear an account of what he called "Permanent Patency of the Mouth of the Aorta, or Inadequacy of the Aortic Valves," although he stated clearly the fact that the aortic valves may leak by reason of dilatation of the aorta itself, and two of his figures are obviously those of syphilitic lesions.

This much, then, was recognised by the middle of the last century: the syphilitic origin of many aneurysms of the thoracic aorta; the fact that disease of the aortic wall precedes the development of aneurysm; the occasional determination of

* The Lumleian Lectures, 1930, delivered before the Royal College of Physicians of London.

gummatous and fibrotic processes to the cardiac wall, and the occurrence of insufficiency of the aortic valves.

Thereafter the study of this relation between syphilis and cardiac disease made but slow progress in spite of Clifford Allbutt's [2] and Heubner's [28] discovery of the syphilitic origin of certain peri-arterial lesions, and Welch's [57] emphatic reiteration of the importance of syphilis as a cause of aortic aneurysm in the British Army. Writing in 1876, he blamed syphilis for over 60 per cent. of these, and also described aortic nodulation as present in two-thirds of his post-mortem examinations of men who had had syphilis. In the latter part of the last century, Phillips's [42] paper showed that syphilis had to be reckoned with as a cause of cardiac disease in civil practice also. General recognition of the truth and significance of these doctrines was, however, delayed until the present century, when fresh light shone into this dark corner from two different angles. On the one part the infective nature of syphilis, always suspected on general grounds, was clearly demonstrated by Schaudinn and Hoffmann. This was followed by the discovery of the complement-fixation test and its applicability to the diagnosis of syphilis. These two steps forward were inevitably succeeded by a third, when Ehrlich brought forward his synthetic arsenical preparations for the extinction of the spirochæte. Thus we advanced to a point from which the whole field of activity of the syphilitic virus might be resurveyed, and thus it was that the aortic lesions—their frequency, their nature, and their gravity—came to be revalued. At the same time the study of cardiac disease in its physiological aspects, in its relation to disturbance of function, was awakening new interest in the intracardiac localisation of morbid processes. We cannot too often remind ourselves of the honourable part played by Fellows of this College—Allbutt, Mackenzie, Lewis, Wenckebach, and others—in this advancement of our learning. One immediate and practical outcome was a renewed interest in the distribution of the lesions of syphilis within the heart.

It is not a matter for surprise, therefore, that the past decade should have produced a large number of papers on cardiovascular syphilis. When I first determined upon the choice of that subject I hoped that I should be able to lay before you a critical summary of all this work, but when I tried to do so I was confronted by three principal difficulties. In the first place, many of the points on which I felt doubtful or uncertain did not seem to be noticed at all in this new literature. Secondly, other points proved controversial, one author expressing views diametrically opposed to that of another. Finally, the bulk of the papers was so great and some of them were so inaccessible that I felt obliged to fall back on my own observations in order to secure the necessary data. By way of furnishing a basis for this review of the subject, I have analysed the records of 103 patients with cardiovascular syphilis whom I have seen, both in private and in hospital practice, since the war. That these are all of them authentic cases of syphilitic infection would, I think, be agreed by everyone. In each there was either a history of syphilitic infection or clinical evidence of some other syphilitic lesion, or a positive reaction to the Wassermann test, or the post-mortem appearances characteristic of syphilitic disease of the heart and aorta. These records have not been in any way selected. The only process of selection was in fact a process of rejection; records of 21 other cases were omitted on the ground that the syphilitic nature of their troubles was not incontrovertibly established. I should not, however, venture to base a comprehensive account of any group of lesions on clinical data alone. Accordingly, I enlisted the help of my colleague, Dr. A. L. Taylor, pathologist to the Bristol General Hospital, and I shall refer to figures extracted from our post-mortem records which he has kindly set out for my use; and to a similar series of data for which I am indebted to Dr. E. R. Cullinan, of St. Bartholomew's Hospital. I have also made a microscopical examination of the heart and aorta in 21 cases of cardiovascular syphilis. These experiences have helped me once more to realise how much there is to be said for the plan of conjoining clinical with anatomical examination. It would, I think, be difficult to get as clear a mental picture of this or, indeed, of any other disease by either method of observation alone. On the one hand the resort to histological inquiry has made the clinical phenomena much more intelligible, while on the other hand the clinical observations give a sense of life to the picture which it would lack if it were drawn from anatomical data alone.

THE FREQUENCY OF CARDIOVASCULAR SYPHILIS.

The data which Dr. Taylor extracted from our post-mortem records are arranged to show, first, in what percentage of all autopsies we may expect gross cardiovascular disease; and secondly, what percentage of that disease is syphilitic. In 1750 post-mortem examinations 354, or 20 per cent., showed cardiovascular lesions; and of these 45, or 12·7 per cent.—almost exactly one-eighth—were syphilitic in type. Dr. Cullinan's figures from St. Bartholomew's Hospital were drawn from 1000 consecutive autopsies on cases from the medical wards. Of these, 456 showed gross cardiovascular disease, which was syphilitic in 33 cases, or in 7·2 per cent.

These data may be compared with some other series:—

TABLE I.

Author and city.	Date.	Number of autopsies.	Cardio-vascular syphilis in: %
Symmers [51] (New York)	1916	4,880	175 (3·5)
Reid [43] (Boston)	1920	1,678	54 (3·2)
Cowan [16] and Faulds (Glasgow)	1929	1,000	60 (6·0)
Taylor (Bristol)	1919–29	1,750	45 (2·5)
Cullinan (London)	1920–26	1,000	33 (3·3)
Clawson [9] and Bell (Minneapolis)	1910–26	4,577 (Pts. over 20)	126 (2·6)

The proportion of cases of fatal syphilis in which aortic lesions are found differs a good deal according to different observers. I have examined many of these statistics, and propose to accept the estimate offered by two experienced observers working on large aggregates of material: Turnbull, [52] of the London Hospital, who found aortitis in 60 per cent. and aortic valvular disease in 15 per cent., and Symmers, [51] of New York, who noted aortic lesions in 55 per cent.

During the twelve years 1918–29, inclusive, I saw and kept notes of 2089 cases of organic cardio-vascular disease. Of these, 100, or nearly 5 per cent., were certainly syphilitic in origin. If to these be added another 21 of doubtfully syphilitic origin, the percentage is raised to nearly 6. If I had limited my inquiry to hospital patients the share of cardiac lesions due to syphilis would have been 8·4 per cent.

Heimann's [27] series, which he was good enough to prepare for me, raises one interesting question; in it the proportion of cardiovascular disease due to

syphilis was as high in Europeans as in negroes. This contradicts the impression received from talks with medical men who have practised in countries with a large negro population, yet it is supported by other evidence. Donnison,[19] of Kenya, has expressed the view that cardiac syphilis is rare among negroes, and this has been the experience of friends of mine at work in different parts of Africa—Drs. C. C. Chesterman, Alan Bodman, A. J. Keevil, and H. W. Brassington—who kindly supplied me with this information. On the other hand, we have American evidence in support of

TABLE II.—*Clinical. Percentage of all Cardiovascular Disease due to Syphilis.*

Author and city.	Total cases.	Percentage due to syphilis.
Coombs (Bristol)	2,047	5·0
Wyckoff and Lingg (New York)	1,001	9·0
Coffen (Portland, Oregon)	1,673	4·1*
Harris (Liverpool)	—	9·0
Heimann (Johannesburg)	253	15·0

* 5·0 per cent. if organic disease only is included.

the view that negroes are more liable than whites to this disease. Wyckoff [61] and Lingg found that in New York the proportion of cardiovascular disease attributable to syphilis was more than twice as high in negroes as in white patients; and the experience of Swift [50] and Kimbrough, in a Southern State, was to the same effect. Apparently the negro is only more liable to exhibit signs of cardiac syphilis in so far as he is liable, when exposed, to be infected by syphilis. That the syphilis attack-rate in these States is much higher among negroes than among whites may be deduced from a recent paper by Cutting,[18] Loria and Pickell, of New Orleans, and from others from similar sources.

Another contrast is that between the frequency of cardio-aortic syphilis as estimated clinically and its incidence at post-mortem examinations. In our Bristol General Hospital series, for example, the post-mortem incidence was half as large again as that of the cardiosyphilitics as defined clinically. To this discrepancy several influences contribute. One is the liability of these patients to sudden death. Such victims as these find their way into the pathological statistics, but for the most part fail to be observed and recorded by the clinician. Again, there is no doubt that a certain proportion of cardio-aortic syphilis is subclinical in degree. There are lesions that can be seen with the naked eye in an early stage, yet they have not reached the point at which symptoms are produced. In this, cardiac syphilis resembles neurosyphilis. By the time that symptoms appear, whether cardiac or nervous, the anatomical changes on which these depend are already advanced; for Nature has endowed vital tissues with so wide a margin for emergencies that destructive agencies can only evoke those expressions of organic inadequacy that we call "symptoms" by inflicting gross injury, gross enough to destroy a large share of that margin.

There are two other reasons that may help to account for some of this discrepancy between clinical and pathological percentages. The first of these is the somewhat conservative view, that I must confess I hold, as to what constitutes satisfactory ground for a diagnosis of cardiac syphilis. No one would, I think, argue that any of the cases to be discussed presently should be excluded from this paper; but some might say that others ought to have been included. As examples, I have in my mind three patients. One, a man of 46, presented signs of mitral stenosis with auricular failure and also symptoms of locomotor ataxia. The second, a woman, also in middle life, showed exactly similar cardiac signs, with a liability to miscarriage and a positive Wassermann reaction. The third, a girl of 9, a congenital syphilitic whose tabetic father was also my out-patient, displayed signs of early mitral stenosis, together with a typical rheumatic chorea. I have excluded all of these from my group of cardio-syphilitics, on the ground that the lesion displayed—that of mitral stenosis—was one which could not conceivably owe its origin to syphilis, any more than the tabes of the first of these three could be attributed to the rheumatic infection that had injured his heart.

One other reason for the discrepancy under discussion is that pathologists find it almost as difficult as do clinicians to discriminate between what is and what is not syphilis. For this we have to thank the influence of atheromatous change, so often to be seen in those very persons who also exhibit the aortic lesions of syphilis. Not only do these two processes often impinge simultaneously and almost inseparably from one another on the aorta itself, but also, even when the syphilitic lesion has the aorta to itself, its ravages are found to be supplemented by atheromatous disease in the coronary trunks. As a result of this confusion I feel sure that there is a tendency at the present time to label as syphilitic, on the score of the naked-eye appearances, cardiovascular lesions which histological examination would discover to be degenerative.

When we consider all these factors, then, it is not surprising that we find an appreciable discrepancy between clinical and pathological views as to the part played by syphilis in accounting for cardiovascular disease. The frequency of cardiovascular syphilis may be summarised by saying that when we are confronted by an organic lesion of the heart there is a chance of its being syphilitic that varies from 5 to 15 per cent. in different parts of the world.

RESPONSIBILITY OF SYPHILIS FOR CERTAIN KINDS OF CARDIAC DISEASE.

About the part of syphilis in the causation of thoracic aneurysm there is no room for doubt. Camille Lian found evidence of a syphilitic origin in 83 per cent. of his cases, and this accords closely with the experience of most observers from Francis Welch [57] onwards. Abdominal aneurysms are far less often syphilitic. This accords with Turnbull's [52] observation that aortic syphilis is found most often in the first part of the thoracic arch, more than four times as often as in the abdominal portion. It is that stretch of aorta from the sinuses of Valsalva to the origins of the main trunks supplying the head and arms that suffers most, and it is from this stretch that nearly all syphilitic aneurysms arise. For the following data, from the Leeds General Infirmary, I am indebted to Prof. M. J. Stewart and Dr. H. G. Garland.

TABLE III.—*Frequency of Syphilitic Aneurysms in Different Situations.*

Site.	Total number of aneurysms.	Syphilitic.	Percentage of total.
Aorta—			
Ascending	37	32	88·8
Transverse	21	15	71·4
Descending	19	11	57·8
Abdominal	14	5	35·7
Heart	27	3	11·6

In fact, we are justified in assuming that a saccular aneurysm arising from the aortic arch is syphilitic unless there is strong evidence in favour of an alternative view.

About aortic incompetence, however, there is wide difference of opinion. My own Bristol figures show that of 130 hospital in-patients with signs of aortic incompetence 39, or 30 per cent., were syphilitic. Cowan [16] and Faulds found in Glasgow that of 224 patients with aortic incompetence 32·1 per cent. owed their lesion to syphilis. Harmer,[25] scrutinising a series of 467 cases of aortic incompetence, held syphilis responsible for 37·3 per cent. of all those patients whose ages lay between 20 and 70, and

pointed out that 35 was the watershed age between rheumatism on the one hand and syphilis on the other. On the other hand, Longcope,[38] in 1913, thought that three-quarters of the cases of aortic regurgitation seen in adult life were syphilitic. More recent series by Wittgenstein [59] and Allan [1] arrive at a closely similar result. Here it is likely that a good deal of the divergence may arise from a different conception of what is meant by aortic incompetence. Some of the higher estimates are probably based on series from which cases exhibiting additional cardiac lesions, such as mitral stenosis, have been excluded. In our own figures we are speaking of all cases in which a leak in the aortic valve has been detected, no matter what other lesions may have been present. Camille Lian, discriminating between the rheumatic and the non-rheumatic kinds of aortic leak, found a positive Wassermann test in one out of nine cases of the former and 88 out of 108 cases of the latter. It is obvious that the percentage must vary widely, not only with the incidence of syphilis, but also with that of rheumatism, an infection showing such wide geographical variations as to render comparisons between one series of figures and another almost worthless.

Although in my view the use of the term "angina pectoris" is to be deprecated, since it tends to exalt to the status of a syndrome that which is no more than a symptom, yet it is convenient to glance for a moment at those conditions in which præcordial pain excited by effort is the outstanding experience. In a group of 249 patients whose troubles were of this kind, 38, or 15 per cent., came from the syphilitic category. In other words, the share borne by syphilis of the responsibility for kinds of organic disease in which præcordial pain on effort occurs is three times as great as it is for organic heart disease in general, where its share is only 5 per cent. By way of comparison, I have worked out the share borne by the other forms of cardio-arterial degeneration—the hyperpietic and the senile—of these same 249 examples of ischæmia cordis; and I find that these two degenerative influences accounted for 62 per cent., whereas these same categories were only responsible for 42 per cent. of the whole mass of organic heart disease. The comparison, therefore, works out as follows: whereas the hyperpietic and the decrescent classes of cardio-vascular degeneration account for one and a half times as big a share of the pain syndromes as of cardiac disease in general, the corresponding ratio in the case of syphilis is as 3 to 1. In other words, syphilis, when it attacks the cardiovascular apparatus, is twice as likely to involve its victim in a liability to præcordial pain on effort as are the more common forms of cardio-arterial degeneration. This relation, between syphilitic infection of the aorta and heart and cardiac pain, also possesses a particular interest for me, since it was an anomalous feature of this relationship that caused me to re-examine the whole subject. When analysing the conditions under which cardiac infarction occurs, I was greatly surprised to find how small a part syphilis takes in preparing the stage for this tragedy. On inquiry I learnt that this had been the experience of other observers also. For instance, in Levine's [35] large series of cases of coronary thrombosis the Wassermann test reacted positively in only three of the 89 cases to which it was applied; and of the 46 cases examined post mortem, only two showed aortic syphilis. In my own practice, of over 100 cases where I have made a diagnosis of cardiac infarction, generally on the ground that severe sternal or epigastric pain has been followed by evidence of gross damage to the cardiac wall, the background has been syphilitic in one only. This formed so striking a contrast with the incidence of cardiac pain without subsequent organic change that I was moved to institute a careful comparison between the ætiology of these two syndromes. The results of that comparison were to show that, whereas syphilis is a leading cause of cardiac pain without organic sequelæ, it takes but a small part in bringing about coronary occlusion. The reason for this anomaly will appear when the anatomical state of the syphilitic heart comes to be discussed.

Cardiac pain is so often an early symptom o what in my own nomenclature is, perhaps presumptuously, entitled "ventricular failure," that I pas naturally to a consideration of other aspects of thi kind of cardiac defeat. Parkinson [41] and Bedford, i discussing the causation of that which they describ as "heart failure with normal rhythm," found syphilitic element in 21 out of 100 cases. Thi is that same form of heart failure that Herapath [11] an I ventured to label "ventricular," and my own dat agree with those quoted in ascribing a prominen share in its production to syphilis. In another pape Herapath [12] and I analysed a group of 163 cases o what we called "auricular failure"—the type o breakdown that is often designated "fibrillation or "total arrhythmia," both of them unsatisfactor labels since each denotes only one aspect of the whol affair—and found only three, less than 2 per cent., i which syphilis was known to be a cause.

Finally, there is the question of heart-block When this category of cardiac failure was first define the gummata seemed likely causes, and indeed som examples were described; for instance, a remarkabl case reported in 1906 by Keith [32] and Charles Mille Possibly the wish was father to the thought; w hoped that we were being led to a new chapter i cardiovascular therapeutics, wherein localisation function would pave the way for triumphant attack upon circumscribed areas of disease. Be that as may, it is now clear that syphilis is not a commo cause of heart-block. My colleague Dr. Herapat stated that in his series of 20 cases of heart-bloc only two had been syphilitic. The experience Gallavardin [22] has been identical; of 39 cases of heart block three were undoubtedly and one possibl due to syphilis.

These glimpses of the chief cardiac syndrome have shown us, then, that syphilis plays the leadin part in the production of aortic aneurysm and a important part in rendering the aortic valve inadequate; that it takes almost as large a shar of responsibility for failures of the ventricular typ and for stenocardia of the transient degree, but not of much account in causing cardiac infarctio auricular failure, or heart-block.

Age- and Sex-incidence.

The impressions on which this clinical pictur is based are derived from a study of the 100 patient of whom I have already spoken, with three othe seen during the current year. The incidence of th disease in regard to age and sex was not differen from that in the series published by other observer The average age at which symptoms were firs experienced, in 52 cases in which this was ascertaine was 49·6 years, the extremes being 32 and 64 year Mitchell Bruce,[6] in his Lumleian lectures, found tha the syphilitics in his series of cardiovascular degenera tions felt their first symptoms at an average ag of 49. The age-incidence of Dr. Cullinan's autops cases was as follows:—

Only one under 37 years (aged 28).			
37 to 40	years	.. ..	5 cases.
40 to 45	,,	.. ..	2 ,,
45 to 50	,,	.. ..	7 ,,
50 to 55	,,	.. ..	6 ,,
55 to 60	,,	.. ..	7 ,,
Over 60	,,	.. ..	4 ,,

The time that had elapsed between infectio and the onset of symptoms averaged 22·7 yea in my patients. This is a little longer than i most series, but in Mitchell Bruce's cases it wa longer still—25 years. This long incubation perio that elapses between the invasion of the body b the virus and the development of symptoms cardiovascular disease brings these lesions into th

ame epoch of the infection as locomotor ataxia and eneral paralysis. It is surely no accident that here is so close a likeness between these two ets of syphilitic phenomena, the cardiac and the ervous. The disease has evolved in the same way, nd the only differences that are to be noted are due o the differences of function. We are to expect a ather earlier outcry on the part of the nervous ystem, since it is always a more sensitive index of isease than any other part of the body; and this is vhat happens in syphilis. The earliest symptoms f tabes and general paralysis are noted, on an verage, at an age that is a little earlier than the ymptoms of onset of cardio-aortic syphilis.

There is a similar correspondence between the wo sets of lesions, the cardiovascular and the ervous, in respect of their sex-incidence. Actually 0 per cent. of my patients were males, and this reponderance is found in most series, though in ur post-mortem series the females accounted for 9 per cent., an exception that I do not here ttempt to explain. I can see no strong reason for upposing that the sex-incidence of these later yphilitic phenomena is in any way deceptive. It s usually taught that women are less likely to seek arly treatment for syphilis than men are because he primary lesion is so much easier to overlook in omen than in men. This being so, the scales etermining the probability of effective treatment re heavily weighted in favour of the man. If, in pite of this, men are more apt to develop late syphilis f vital organs, is it not probable that this liability presents a corresponding liability on the part of en to contract syphilis? This is what I should ave expected, for it is to be presumed that most en contract syphilis from intercourse with a rostitute, and it is also to be presumed that an fected prostitute passes on the infection to more an one man. Dr. Hardy Kingston, who is in harge of the Venereal Disease Clinic in Bristol, lls me that during 1929 the new cases of syphilis mong men were four or five times as numerous s among women, and I imagine this is an average xperience. In congenital syphilis of the aorta there s, as far as I can discover from the records, no strong redilection for the males; and this impartiality ay not unreasonably be ascribed to the fact that hen infection is conveyed through the medium of he placenta to the unborn child there is no way in hich the sex of the victim can affect the matter.

Two other points are worthy of note in connexion ith the aortic lesions of congenital syphilis. One that the incubation of these lesions is if anything horter than it is in the case of acquired syphilis. n many of the recorded instances the diagnosis was ade before the patient had reached the age of . Congenital syphilis is fortunately becoming less common disease, and it is therefore to be hoped at the future will hold little opportunity for investiation of the reason for this; but it is perhaps not nciful to see in the shorter incubation an expression the intense nature of the infection in inherited as mpared with acquired syphilis. Here, again, as the sex- and race-incidence, we seem to discern a rect proportion between the total force of the fection and its aortic consequences. The more able the subject is to syphilis, the more liable he is syphilitic aortitis; and this relation is so nearly rect that there seems little need to introduce other edisposing factors to explain away the greater bility of the male.

In congenital syphilis of the heart and aorta, in the acquired disease, the aortic lesions fall into the same epoch as those of the cerebro-spinal axis—i.e., they appear at roughly the same interval after birth. Once again, then, we are reminded of the close similarity between the age- and sex-incidence of cardio-aortic syphilis on the one hand and that of cerebro-spinal parasyphilis on the other.

A PROTEOSE IN THE URINE,

EXCRETED IN ANAPHYLACTIC AND ALLERGIC CONDITIONS.

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IN a previous communication[1] we reported that, if the urine from cases of allergic and febrile diseases is acidified with sulphuric acid and shaken with a fifth of its volume of ether, the ethereal layer formed on standing, instead of being for the most part clear, as in normal people, becomes opaque, and has a waxy appearance. In strongly positive cases we noted that the tube could be inverted without spilling the contents. We have since found that,[2] if this reaction is carried out in a separating funnel and the lower layer run off, the supernatant layer, when shaken with an equal volume of alcohol, yields a precipitate of a complex nitrogenous substance, which has interesting biological properties.

A 24 hour specimen of urine is collected from a case showing active symptoms, and put in a Winchester bottle containing a little chloroform. Approximately 400 c.cm. is placed in a separating funnel, rendered acid to Congo red with sulphuric acid, and shaken with 100 c.cm. or less of ether. Should the specimen contain urates, it is rendered alkaline with dilute caustic soda to dissolve them, and subsequently made acid. When the two layers are separated, the ethereal layer is treated with an equal volume of alcohol, and the precipitate allowed to settle. The latter is then collected by centrifuging in a sterile centrifuge tube. This tube is inverted in an incubator at 37° C., and the alcohol and ether, present in the precipitate, are allowed to evaporate. When dry, the precipitate is dissolved in sterile N/10 sodium hydrate. The quantity of sodium hydrate required varies with the case, but 2 or 3 c.cm. are usually sufficient. Taking the usual aseptic precautions, 1 c.cm. of this solution is added to 9 c.cm. of 0·5 per cent. phenol dissolved in normal saline. We are accustomed to call this dilution 1 in 100 for convenience. The quantity of precipitate obtained is usually about 0·3 g., so that the NaoH solution is approximately 1 in 10, but, as weighing each precipitate would involve loss of sterility, the exact quantities are ignored. Further dilutions of 1/1000, 1/10,000, 1/100,000, and 1/1,000,000 are made. The sterility of the solution is then tested by inoculating an agar slope, and incubating for 48 hours. If care is taken, the solutions are usually sterile. The chloroform in the 24 hour specimen, and the subsequent treatment with ether and alcohol, seem to kill the contaminating organisms. This is fortunate, as heating destroys some of the properties presently to be described.

Chemical Properties.

The chemical properties of this precipitate are complex, and it appears to belong to the ill-defined group of the proteoses. An exact analysis has not yet been carried out, but an aqueous solution gives the following reactions. The Biuret test is positive, a violet colour being obtained. Millon's reaction is also positive, as is the xanthoproteic. The presence of

* Working with the aid of a grant from the Medical Research Council at the Asthma and Dermatological Clinics, Guy's Hospital.

carbohydrate is indicated by the positive reaction to Mollisch's test. On hydrolysis and analysis by Kossel's method,[3] histidine, arginine, and lysine are found to be present, also various mono-amino acids. It is not coagulated by heat, but is precipitated by heavy metallic salts such as lead acetate, and by alcohol. It is not completely precipitated by half saturation with ammonium sulphate, but is by full saturation. When the substance is hydrolysed with dilute hydrochloric acid a brown precipitate is obtained; this contains phosphorus, and is presumably nucleic acid. From the filtered products of hydrolysis we have succeeded in making an ozazone. It must be remembered that normally a small quantity of mucus is present in urine, secreted by the epithelium of the urinary tract, and this would be extracted by the method outlined above.

We have recently attempted to obtain quantitative figures of the amount of this "proteose" present. This has been done by extracting it from 100 c.cm. of urine, and estimating the contained nitrogen by the method of Kjeldahl. It is found that in the "normal" person (students and laboratory workers in apparent health) the daily output of nitrogen, recovered by this method, varies between about 7 mg. and 25 mg. per diem. Table I. shows comparative figures in health, and in some conditions which we have had the opportunity of investigating.

TABLE I.

Normals.	Proteose N. (Mg. per diem.)	Total N. (Mg. per diem.)	Proteose N. per cent.
1	8	8,896	0·09
2	28	7,968	0·35
3	27	9,708	0·28
4	17	10,931	0·16
5	25	13,977	0·18
6	11	4,900	0·24
7	23	7,940	0·3
8	11	8,064	0·137
9	33	16,018	0·2
Average	20·3	9,811	0·21
Pemphigus	88	9,800	0·82
	65	2,975	2·2
Psoriasis	142·6	9,786	1·46
	113	13,176	0·9
Urticaria	64·2	5,412	1·2
Asthma prurigo	290	12,880	2·2
	49	6,443	0·76
	191	10,380	1·8
	220	12,650	1·8
	126	11,365	1·1
Phthisis—			
Active	122	6,468	1·9
Recovering	70	7,585	0·92
Rheumatism—			
Acute	159	7,330	2·6
Recovering	20	5,026	0·4

This method will probably be found to provide a simple means of estimating quantitatively the "albumose" which has long been known to exist in febrile urines (Wells). We are here concerned with this substance in its relationship to allergic conditions. We will refer to it as "proteose," although it is obvious from the analysis given above that it may contain nucleoprotein, and even glucosamines.

In a case of anaphylactic shock following the intravenous administration of a very small quantity of antidysenteric serum, previously described,[1] the chief urinary findings were as follows:—

1. For the first six and a half hours after the onset of shock there was complete anuria. After this, very small quantities of highly acid, concentrated urine were passed. The followed the post-paroxysmal diuresis.

2. The first specimen of urine passed deposited urates and the first three contained albumin.

3. The free acidity rose very markedly during the firs 12 hours; during the post-paroxysmal diuresis it fell to low figure. The ammonia excretion, relatively high a first, remained so during the diuresis, thus disturbing sti further the ratio of free-acid to ammonia-combined acid.

4. The ether reaction was very strongly positive in th first specimen obtained, and remained so until the diuresi was established; it was still positive on the morning of th third day.

In this case the diuresis did not occur until th evening of the day after the shock.

Recently we have had the opportunity of observing a case of serum sickness, following the administration o antidiphtheritic serum.

A CASE OF SERUM SICKNESS.

The patient, a medical man aged 25, had had three previou injections of antitetanic serum, the last about one and a hal years ago. He was given a prophylactic dose of anti diphtheritic serum, having been coughed at by a child wit diphtheria. Four or five days later (the short incubatio period being doubtless due to the previous injections c serum), the symptoms of serum sickness began. He wa seen by us at 11 A.M. on Dec. 31st, 1929, after a very uncom fortable night, and having had complete anuria; at tha time there was generalised adenitis, his expression was pal and anxious, and a profuse urticarial eruption was appearing He was instructed to collect all the urine passed, and wa seen again at 2.30 P.M., at which time the urticaria wa intense. An injection of adrenalin was given, whic temporarily relieved the itching, and he was put to bed an ordered large quantities of powdered glucose in lemonade Until 1.30 A.M. on Jan. 1st, 1930, only 315 c.cm. of urin were passed; at this time diuresis began, and between 1.3 and 4 A.M. he passed 2010 c.cm. This diuresis was accom panied by a great amelioration of the symptoms, and b 8.30 A.M. the urticaria had disappeared and he felt com paratively well. There was no relapse.

Tables II. and III. summarise the most importan urinary findings in these two cases:—

TABLE II. (Case 1).—*Anaphylactic Shock Following th Administration of Antidysenteric Serum; Shoc Commenced 3.30 p.m., July 19th.*

Vol. (c.cm.).	Date in July.	Time.	Free acid.	Ammonia (mg.).	Ratio of free acid to A.-c. A.	Urea (g.).	Albumin.	Urates deposit.	Ether reactions (proteose).
30	19	10 p.m.	34	129·2	1 : 2·2	3·0	++	++	+++
15		M.	36	122·4	1 : 2·0	2·9	++	−	+++
75	20	2 a.m.	54	122·4	1 : 1·3	2·7	+	−	+++
150		5 ,,	82	136·0	1 : 1·0	2·7	Nil.	−	+++
120		8 ,,	78	136·0	1 : 1·0	2·9	,,	−	+++
390	—	—	281·8	517·0	1 : 1·0	10·75	—	—	Total.
180	20	7 p.m.	6	30·6	1 : 3·0	1·3	Nil.	−	+
180		8 ,,	4	27·0	1 : 4·0	1·2	,,	−	+
210		10 ,,	4	27·0	1 : 4·0	1·0	,,	−	+
150		11 ,,	2	23·8	1 : 3·5	0·088	,,	−	+
45	21	6 a.m.	34	102·0	1 : 1·8	2·0	,,	−	++
150		8 ,,	22	78·2	1 : 2·0	1·9	,,	−	+
915	—	—	77·7	359·0	1 : 2·7	11·72	—	—	Total.

M. = Midnight. A-c. A. = Ammonia-combined acid.

It should be noted in the second case (Table III. that:—

1. The three specimens obtained before diuresi began deposited urates, and gave very strong ethe reactions.

2. The ammonia excretion was very high, thu causing a marked alteration in the free-acid :: ammonia combined-acid ratio.

3. With the onset of diuresis there was a sudden drop in the free-acid and to a less extent of the

ammonia combined-acid, and urates were no longer deposited.

4. The ether reaction became negative, and no proteose could be obtained.

It will be seen that the cycle of events in these cases —one of serum anaphylactic shock and one of serum sickness—is practically the same, and is comparable to that previously described as characteristic of allergic conditions, such as the prurigo of Besnier with asthma, infantile eczema, urticaria, and angeioneurotic œdema.[1] It should be noted, however, that in the first case the onset of symptoms, which were those of profound shock, occurred while the serum was actually being injected, whereas in the second there

TABLE III. (Case 2).—*Patient with Serum Sickness.*

Vol. (c.cm.)	Time.	Titrable acid (c.cm.).	A.-c. A. (c.cm.).	Urea (g. per 100 c.cm.).	Ratio of free acid to A.-c. A.	Urates deposit.	Proteose.
		N/10 NaoH (per 100 c.cm.).					
45	12.30 p.m.	26	130	3·35	1 : 5·0	+	+++
240	8.30 ,,	26	104	3·54	1 : 4·0	+	+++
30	9.40 ,,	28	126	3·24	1 : 4·5	+	+++
540	1.30 a.m.	2	6	0·34	—	Nil.	Nil.
420	3.0 ,,	2	10	0·39	—	,,	,,
1050	4.0 ,,	2	10	0·43	—	,,	,,
60	5.0 ,,	6	20	0·41	—	,,	—
480	8.30 ,,	6	28	0·33	—	,,	—
Wheals disappeared.							
420	12.40 p.m.	6	32	1·1	—	,,	—
600	1.0 ,,	2	10	0·35	—	,,	—
900	3.0 ,,	2	22	0·52	—	,,	—
840	10.0 ,,	4	18	0·5	—	,,	—
660	11.30 ,,	Neut.	20	0·52	—	,,	—

was an incubation period shorter than usual — presumably because antitetanic serum had previously been given on more than one occasion. This latter case threatened to be a severe one of serum sickness, and the symptoms would have been expected to continue for some days. We consider it probable that the rapid recovery can be attributed to the administration of large quantities of glucose; it is possible that, if given just before and for several days after injection of foreign serum, powdered glucose might prevent serum sickness, or, if taken in large doses at the onset, might—as apparently in our case—abort the attack. Further observations on long series of cases are, however, obviously required to establish this suggestion.

Proteose Tests from Urine in Serum Sickness.

The proteose, isolated from the urine of the case of serum sickness referred to above, was put up in various dilutions for certain tests to be detailed below:—

At midday on Jan. 2nd, 1930, 0·1 c.cm. of the patient's own serum, obtained during the period of active symptoms, was injected intradermally in the left forearm of one of us (H. W. B.) at two sites (*a* and *b*). At 4.45 P.M. on the following day, 0·025 c.cm. of a 1/100,000 dilution of the proteose was injected intradermally into one of the sites (*a*) and into the other site (*c*) not previously injected with serum; into site (*b*) 0·025 c.cm. of the same dilution of the proteose obtained from the urine of another patient (a case of prurigo) was injected. At 6.30 P.M.—i.e., one hour and three-quarters later—there had developed at site (*a*) an oval wheal about half an inch in size, surrounded by a zone of bright erythema ("flare"). At sites (*b*) and (*c*) small circular wheals without flare were apparent, corresponding in size merely to the elevations produced by the intradermal injections of proteose solution. At 9.30 P.M. the wheal at (*a*) was of about the same size, but had developed a finger-like prolongation from its lower border; the "flare" had almost disappeared. The small wheals at (*b*) and (*c*) had diminished in size, the latter being hardly visible. At 11.45 P.M. the wheal at (*a*) was slightly smaller, but the prolongation had increased in length. There were but traces left of those at (*b*) and (*c*). At 10 A.M. the following morning there were still the flattened remains of the wheal at (*a*) with its prolongation. Nothing but the puncture marks could be seen at (*b*) and (*c*).

The experiment corresponds to the Prausnitz-Küstner reaction. Two areas of skin of a normal person were injected with the serum of a patient in a state of allergy towards horse-serum; as is well known, the antibodies contained in the sensitised serum are fixed by the skin at the site of injection, so that when, 24 hours later, the specific antigen is injected at the same site, an urticarial wheal results. Of the two areas thus sensitised the one (*a*) developed a characteristic wheal of considerable size, with a temporary flare and lasting many hours, after injection of the patient's proteose in high dilution, whereas the other (*b*) gave no response to the proteose of another patient; the non-sensitised area (*c*) did not react to the proteose of the case of serum sickness, which was also injected into another normal subject without response.

Intradermal injections in a dilution of 1/100,000 of the proteose obtained from this case of serum sickness were then made in three subjects known to be horse-sensitive, and positive reactions were obtained. Proteose in the same dilution from an allergic patient, non-sensitive to horse, gave negative reactions. In one of these patients—a horse-asthmatic—the intradermal injection of the proteose from the patient with serum sickness was followed by rhinorrhœa and slight asthma the same evening, although he had not had these symptoms for some time previously.

From these experiments one may conclude that the proteose contained the antigen to which the patient was sensitised, and their importance lies in the fact that the nature of the primary antigen was known.

Two similar experiments were also made by one of us (G. H. O.) in cases in which the antigen was unknown. In a case of migraine the patient's blood was obtained during an attack, and the serum was injected intradermally at two sites in G. H. O.'s arm. The proteose prepared from the urine, collected during the attack, was put up in a dilution of 1/10,000, and on the following day tested on one of the sensitised areas of skin by the scratch method; a wheal with surrounding "flare" resulted, whereas the proteose from a case of asthma in the same dilution gave a negative response when scratched into the other sensitised area. An intradermal test with the proteose from the case of migraine on an unsensitised area of skin was negative. The experiment was repeated in a case of dermatitis herpetiformis with the same result.

It would thus appear justifiable to believe that the proteose excreted in the urine in allergic states contains the active antigen, probably, as will be seen, in combination with the products of tissue autolysis. This view is confirmed by the extraordinary sensitiveness of certain patients even to intradermal injections of minute quantities of their own proteose, and by the therapeutic effect of repeated injections. In the description of the chemical properties of the proteose it was remarked that, when it is hydrolysed with dilute hydrochloric acid, a brown precipitate is obtained, which contains phosphorus and is presumably nucleic acid. Lewis,[4] in an account of his studies with Grant of a person highly sensitive to fish, remarks in a footnote that the active substance in the fish extract employed "appears not to be a coagulable protein, nor is it histamine; Dr. C. R. Harington regards it as associated with nucleic acid. . . ." It is possible, therefore, that the antigenic moiety of urinary

proteose is the part that yields a phosphorus-containing substance on hydrolysis with hydrochloric acid.

Significance of Urinary Proteose.

It must be clearly understood that, as will be seen from Table I., a small quantity of proteose can be recovered from the urine of a normal person in apparent health, but that, when this is scratched or injected into his skin, no local or general reaction results. The total quantity of proteose excreted in the urine is relatively large in acute infections, in anaphylaxis, and in acute and chronic allergic conditions, but from the practical standpoint it is the antigenic moiety that is of importance. In allergic conditions with recurrent crises—e.g., urticaria and certain cases of asthma and prurigo—it is essential that the urine be collected throughout a period that covers the paroxysm, in order that the antigenic substance may be obtained. In chronic conditions, such as psoriasis and rheumatoid arthritis, in which there are no recurrent paroxysms, a 24 hours' specimen of urine should be collected. We have found, for example, in urticaria and asthma that the proteose, isolated during a quiescent period, may give negative cuti- and intradermo-reactions, whereas with that obtained during the stage of active symptoms the reactions are positive.

It is well known that some of the symptoms of anaphylactic and allergic reactions in general, such as urticaria and the contraction of plain muscle in certain organs, may be explained in the light of Lewis's [4] researches as resulting from the local liberation of histamine from sensitised cells, owing to the contact of antigen with the antibodies contained in them. Further, as Dale [5] suggests, anaphylactic injury of the cells of an organ like the liver might liberate histamine into the general circulation in sufficient quantity to cause a reaction in cells of other tissues, not themselves sensitised to the antigen, but sensitive to histamine. Manwaring [6] and others have shown that in dogs sensitisation to an antigen is confined almost entirely to the liver-cells; as a result of anaphylactic damage to them, a substance having histamine-like effects (anaphylotoxin) is liberated, and produces its characteristic action not only on the vessels of the liver itself but also on plain muscle structures elsewhere in the body. Dean,[7] from his post-mortem examination of a case of fatal anaphylactic shock, has pointed out the similarity between such shock in man and in the dog, the chief and essential change in both being in the liver, and we would here emphasise again the evidence of hepatic damage, as revealed by examination of the blood and urine, in both acute and chronic allergic states in human beings.

But, as Dale insists, the liberation of histamine will not account for all the symptoms and disturbances that occur in anaphylactic shock and allergic states. Thus the diminished coagulability of the blood, which is constantly found during the anaphylactic reaction in all animals, is not produced by histamine, but is a result of hepatic damage by various toxic substances. Dale points out that this fact alone suffices to show that constituents of the liver-cells other than histamine are liberated. He says further that "it is unlikely that the histamine, which the liver must pour into the general circulation under such conditions, will be free; it is more likely to be involved in colloidal complexes with the other cell-constituents."

Some recent experiments by Manwaring and his co-workers [8] on dogs are probably of great significance in this connexion. Manwaring, in his earlier experiments, showed that, if the liver of a sensitised dog be completely excluded from the circulation, injectio of the antigen into the blood stream has little or r effect, although histamine under such conditio produces its usual response in small blood-vesse and plain muscle. Manwaring concluded that t symptoms of anaphylactic shock in the dog were d to an anaphylotoxin produced in the liver, and havi a histamine-like action. He has since shown transplantation experiments that, as smooth musc structures can be actively immunised against t anaphylotoxin, the latter must be regarded as secondary antigen, "presumably of protein natu This substance is conceivably a denaturisati product of the primary antigen, either explosive formed from the injected toxic dose of the speci foreign protein, or explosively liberated from storehouse in the hypersensitive liver. In the latt case it would represent a denaturisation product the sensitising dose." Further experiments [9] co firmed this conclusion, which is "that mark chemical alterations take place in specific antige when injected into the animal body, and that ma of the essential immunologic adaptations are to t resulting denaturisation products (secondary antige rather than to the primary antigens origina injected. If this conception of immunological adap tion is correct, it would indicate that there a numerous immunological processes, and presumab numerous specific antibodies, that cannot be demo strated by current serological methods."

If these experiments of Manwaring are applicable human beings, they raise a very important question namely, whether in some allergic states the substa responsible for the symptoms, partially at any ra is not a product of tissue damage, resulting from t action of primary antigens on sensitised cells, p ticularly those of the liver, and acting as a seconda antigen. That sensitisation to the products damaged tissue may occur seems certain. Whitfield has recorded cases of trauma with bruising but witho breach of skin surface, in which a generalis erythemato-urticarial rash, resembling that of ser disease, appeared ten days after the injury, interval that corresponds to the incubation per of serum disease. One of us (H. W. B.) has observ similar cases, and an eruption of the same kind r infrequently follows amputation of the breast, which there is likely to be considerable extravasat of blood. All dermatologists are familiar with ca of chronic eczematous dermatitis of one area of skin, usually on the leg, in which, either after application of some irritant, or from trauma violent scratching, symmetrical eczematous pate appear on parts of the skin widely distant from area primarily affected. In such cases th presumably develops a general epidermal sensiti tion to products of tissue damage absorbed fr this area.

In some cases of allergy, it is true, spec sensitisation to a primary antigen exists, and symptoms occur only on contact with that antig As an example we may cite certain cases of e sensitiveness, manifested by acute urticaria occurr immediately egg is eaten, sometimes even when is taken only into the mouth. In such patie egg-antigen may be the sole cause of the urtica but instances of a single and specific susceptibil are the exception. In most cases of chronic urtica in the prurigos, in dermatitis herpetiformis, infantile eczema, and in many cases of spasmo rhinorrhœa and asthma it is impossible to disco any one specific cause for the attacks; yet, as been seen, such persons are so sensitive to min

oses of the proteose, isolated from their own urine, hat it must contain the antigenic substance. Is it ot likely that this substance is, so to speak, nanufactured on the premises, a product of their wn tissues? Apart from the experimental work of Ianwaring, the evidence we have obtained from iochemical investigations of the blood and urine in hese allergic patients points to the liver as the primary ite of tissue damage. We may, in fact, regard ensitisation of the liver-cells as being the essential actor in the cases we have in mind, and it is probable hat the primary antigens, to which the liver-cells re sensitised, are multiple, so that various foods and heir derivatives or bacterial toxins may excite the roduction by the damaged liver of the actual ubstance responsible for the symptoms. This ubstance, in our opinion, is excreted in the urine, nd contained in the proteose. In certain acute and hronic infections, also, the symptoms may be caused, ot by the direct action of the infecting organism on he structures affected, but by a substance produced s a result of tissue damage by the organism. Many ases of rheumatoid arthritis, for example, can erhaps be explained in this way. The primary ntigen may be a streptococcus or other organism, ut the arthritis might be an allergic reaction towards secondary antigen derived from the action of the ganism on the patient's tissues.

Therapeutic Considerations.

Method of Therapeutic Application of Urinary roteose.—As one is dealing with a chemically pure substance of unknown potency, it is always ecessary to ascertain the reaction of the patient the different dilutions before any therapeutic jections are given. This is done by making idermal tests on the patient with the different lutions. If, for instance, the 1/10,000 dilution is intly positive, and the 1/100,000 is negative, a all intradermal test with 0·025 c.cm. of the 1,000,000 dilution can be made. If this results in faintly positive reaction, the strength is suitable r the preliminary injections. We give gradually creasing doses intradermally, and sometimes sub-taneously, once a week, but time alone will show hether this method gives the best results. If care not taken with the dosage, the patient may react an over-dose by an acute outbreak of symptoms. e have found, however, that positive epidermal d intradermal tests are more likely to be found in patients with recurrent acute manifestations of ergy—e.g., urticaria, certain forms of asthma d of prurigo, dermatitis herpetiformis, and light-nsitisation of the adult type. In chronic conditions thout acute exacerbations, such as psoriasis, they ay be negative, but this does not necessarily imply at a therapeutic effect will not result from injections the proteose. It is in those diseases in which sitive tests are most commonly obtained that acute actions are likely to follow the injection of too ge a dose.

In this paper the methods and results of treatment ll be considered only in patients with cutaneous mptoms. The dermatological conditions for which have given injections of proteose are urticaria, geioneurotic œdema, prurigo of the simple type, the rurigo of Besnier, dermatitis herpetiformis, psoriasis, d light-sensitisation of the adult type. It should noted that some cases classified as prurigo of the mple type should more strictly be labelled eczema-rurigo, and that most of those with Besnier's prurigo l eczematisation, partly no doubt as a result scratching, and either were or had been subject to asthma and paroxysmal rhinitis. One of the patients with psoriasis was first seen with a severe generalised exfoliative dermatitis of six months' duration; her history suggested that it was a complication of psoriasis and this was confirmed subsequently. Our aim has been to present a fair estimate of the value of proteose injections in each of the conditions under consideration; some points of especial interest in certain individual cases will be emphasised. The majority of our patients received dietetic and internal treatment in addition to the injections, but some were purposely given these alone, and among them may be numbered our most satisfactory results.

Urticaria.—Nineteen cases of chronic urticaria and angeioneurotic œdema, all of them of long standing, have been treated in hospital or private practice over a sufficient period of time to allow of conclusions being drawn. In every case dietetic and internal treatments of various kinds had been previously given, and in a few of them other methods of desensitisation had been attempted. Some patients were extremely sensitive even to minute doses, each injection at first provoking an acute attack. The results, as far as we can judge to date, have been very favourable. Sixteen are now entirely free from attacks. In some this result was achieved by a few injections only, in others after two or three months' treatment.

Simple Prurigo.—Thirteen cases have been treated, nine of which are now practically free from itching. One had already become almost free from itching under suitable dietetic and internal treatment before the injections were begun, and cannot therefore be considered. Two were treated successfully by the injections alone, without other treatment. In one, after initial improvement, there was a relapse, and the patient was compelled to go abroad on business. Six cases deserve special mention, as they were particularly severe and intractable and had received expert treatment by other methods before coming under our care. In these we consider the injections were chiefly responsible for the satisfactory results obtained.

Besnier's Prurigo.—The characteristics of this form of prurigo and its frequent association with ichthyosis, asthma, hay-fever, and urticaria have been described in a previous paper.[1] It is clear that most of these patients have an inborn and often hereditary tendency to become sensitised to various antigens, and their life-history is one of repeated or chronic allergic manifestations. It is of interest that a positive van den Bergh reaction of the biphasic type is obtained in a high proportion of cases, even during periods of relative freedom from symptoms. The effect of injections of proteose in these patients has been of great interest. They have all been highly sensitive, even to very small doses, and in several instances severe asthmatic attacks have been provoked, although they had been free from asthma for months or years. It is well known that it is in these cases especially that the phenomenon of alternation of symptoms (*alternances morbides* of Brocq[11]) is met with; for example, when the prurigo or eczematisation is severe the patient is free from asthma, and vice versa. This is by no means constant, for both symptoms may be present concurrently, but on the whole it may be said that the cutaneous and visceral manifestations of allergy tend to alternate.

The initial effect of intradermal injections of proteose appears to be to desensitise the skin, and it is therefore not surprising that, as this improves, a latent visceral symptom, such as asthma, is provoked

If, however, the injections be continued in very small doses—and we think it advisable to give them after a while partly intradermally and partly subcutaneously—the asthmatic attacks cease. With four exceptions this group of patients has received dietetic and internal treatment in addition to the injections, but most of them had been under such treatment for months or years before the injections were begun, and we can therefore state definitely that these, provided the dosage be very carefully controlled, have proved of great value. Moreover, one of the exceptions referred to above—a patient with ichthyosis, eczema, prurigo, and asthma, who had attended many clinics for 18 years—was purposely treated with injections only, and the result has been very striking. Fourteen cases have been treated by the injections; all of them suffered or had previously suffered from asthma, in addition to their prurigo. It is impossible to claim cures in this group of patients, owing to the liability to relapse even after long periods of freedom from symptoms, but in five out of our 14 cases the injections have been discontinued for the past three months, during which time the patients have been comparatively well. The remainder are still under treatment, and are all steadily progressing. An interesting and important observation that we have made in this group is that in those who were ichthyotic the injections have produced a visible effect on the texture of the skin as a whole, so that in some, apart from the condition of the palms and soles, it would be difficult now to recognise the ichthyosis.

Dermatitis Herpetiformis.—In no condition has the effect of proteose injections been more certainly demonstrated than in dermatitis herpetiformis. Nine cases have been treated. One very severe case was given injections only and is free from his eruption at the time of writing. The remaining cases had all received various treatments previously, including dieting, arsenic, auto-hæmotherapy, intestinal vaccine (Danysz), and peptone injections. It can be confidently stated that no other method of desensitisation employed by one of us (H. W. B.) in dermatitis herpetiformis has given results comparable to those we have obtained with proteose injections. Four of these patients had for months relied on arsenic, and in two there were signs and symptoms of arsenical poisoning. On omitting the arsenic a severe relapse of the eruption occurred, but they are now practically well, although it is three months or longer since the injections of proteose were concluded.

One female patient deserves special mention, as she has been under observation by one of us for several years. When first seen the eruption was very severe, the skin was deeply pigmented—partly from arsenical medication—and harsh; she suffered from chronic dyspepsia and obstinate constipation, she was wasted, and lived the life of a semi-invalid. She improved considerably on a carbohydrate-rich but practically vegetarian diet, with injections of an autogenous fæcal vaccine. Later peptone was given by intravenous injection, and subsequently courses of auto-hæmotherapy; these and the addition of glucose to the dietary led to still further improvement both in her general condition and in the eruption, although she was still subject to periodical exacerbations. In November last, injections of a 1/1,000,000 solution of her urinary proteose were commenced and were at first followed by fresh outbreaks of the eruption, but she is now almost entirely free; she has gained several pounds in weight, and the change in her general appearance and the texture of her skin is remarkable. She herself is convinced that the injections of proteose have been responsible for more rapid improvement than anything else.

Psoriasis.—In the majority of cases of psoriasis, treated by us with injections of proteose, the eruption has been associated with rheumatoid arthritis of varying severity (arthropathic psoriasis). In these patients, without exception, a striking feature has been the susceptibility of the affected joints even to minute doses. An injection of 0·1 c.cm. of a 1/1,000,000 dilution is apt to provoke a sharp focal reaction in the joints, with a general but transitory feeling of malaise. The results of treatment in psoriasis arthropathica and in rheumatoid arthritis uncomplicated by psoriasis, have been very encouraging, but the effect has been more noticeable on the arthritis than on the psoriasis. In the few cases of psoriasis, unaccompanied by arthritis, so far treated by this method, the results have been disappointing on the whole, although two cases of generalised exfoliative dermatitis, occurring as a complication of this disease, did well.

Glucose Therapy.

In our earlier paper on allergy [1] we ascribed the therapeutic value of glucose chiefly to the fact that it provides the liver with a rapidly assimilable source of glycogen, which is essential for many of its recognised functions. Further observations have tended to confirm this view. O'Neill, May, and Manwaring have shown that "glycogen disappears almost quantitatively from the canine liver during the first 15 minutes of anaphylactic shock." Zunz and La Barre [13] found an initial hyperglycæmia in guinea-pig anaphylaxis, and McGuigan and Ross [14] a reduction in liver glycogen during peptone shock. This would suggest that the liver-cells utilise glycogen in their antitoxic function against antigenic substances, or, put in another way, that an adequate source of glycogen protects the liver-cells from damage by such substances. It is significant in this connexion that in some of our cases we have found that the proteose excreted while the patient was taking large quantities of glucose, gave negative cuti-reactions, but that, after omitting the glucose for a time, we obtained a proteose which produced positive reactions.

In conditions such as chronic urticaria, pruritus of internal origin, the prurigos, the allergic type of infantile eczema, and certain forms of asthma, the patient is liable to paroxysmal crises, usually nocturnal, which are comparable to repeated minor attacks of anaphylactic shock, and it is probable that these deplete the liver-cells of their glycogen-content so that their glycogenic secretory function is constantly being subjected to an unnatural stimulus. This would explain the rationale of the carbohydrate-rich dietary, with additional glucose or lactose, which clinical experience has proved of value in these cases. We think it important that for therapeutic use the pure powdered glucose should be prescribed in preference to the impure glucosum B.P., and that it should be given in one or two large tumblers of water on waking and at bed-time as well as, if necessary, during the day.

Summary and Conclusions.

1. The preparation and chemical properties of a substance, excreted in the urine and responsible for the ether-reaction, to which reference [2] was made by one of us (G. H. O.) in a previous communication, has been described. This substance, which we have termed urinary "proteose," is of complex composition.

2. Although present in small quantity in the urine of persons apparently in average normal health, it is found in relatively large amounts in acute and chronic microbial infections and admittedly allergic states, and in various other unsuspected or manifest conditions of ill-health. In allergic diseases it would appear to contain the specific antigen to which the symptoms are due.

3. The course and urinary findings in a case of serum sickness are detailed together with experiments designed, according to the Prausnitz-Küstner method, to establish the presence of specific antigen in the urinary proteose.

4. The significance of the proteose is discussed in relation to experimental findings in animal anaphylaxis, and the view is put forward that in chronic or recurrent allergic states, in which the symptoms cannot be ascribed to hypersensitiveness towards one or more known specific antigens, the antigenic moiety of the proteose may be a secondary antigen, produced by the sensitised liver (and possibly by other tissues) on contact with diverse primary antigens. In this case it would correspond to the anaphylotoxin of Manwaring. It is suggested that the manifestations of certain chronic diseases may be caused by sensitisation towards such secondary antigens.

5. The results of the therapeutic application of urinary proteose, in certain diseases of the skin, by means of intradermal and subcutaneous injections of it in high dilution are recorded. The rationale of glucose therapy is also discussed.

In conclusion, it may be said that the importance of urinary proteose lies in the fact that it is a definite substance, which in some acute and chronic diseases appears to contain the specific antigen upon which the symptoms depend, and can therefore be employed for specific desensitisation in measured doses. As a French colleague has put it: "The proteose provides us with a white powder, which is the long-looked-for link between the glass of milk and the colloïdo-clasic crisis."

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BECCLES WAR MEMORIAL HOSPITAL.—At the annual meeting of this institution it was stated that of every shilling of income patients' payments provide 4¼*d.*, the contributory scheme 3¾*d.*, subscriptions 2½*d.*, and endowments 1½*d.*

PAYING PATIENTS AT BIRMINGHAM.—The annual report of St. Chad's Hospital, Birmingham, the primary function of which is to provide expert medical and surgical treatment for persons of moderate means, covers the 12 months to March last. A certain quantity of radium is now available, and there has been a renewal of general equipment. There were 930 in-patients, the largest proportion of whom (324) suffered from affections of the ear, nose, and throat. A labour ward and a nursery have been equipped, and the hospital is now relieving the pressure upon one of the voluntary hospitals by admitting as in-patients who are able to pay fees in accordance with the existing scale. The committee suggest the desirability of some simple system of insurance for paying patients; they believe that a premium of £1 to £1 5*s.* per individual would be adequate. The hospital is prepared to treat patients insured by an outside body on the following scale, irrespective of the kind of treatment required: 10 guineas and 1 guinea for each day's stay, with an additional charge of 10 guineas for a major operation.

PERMANENT HEMIANOPIA IN MIGRAINE AND SUBARACHNOID HÆMORRHAGE.

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I HAVE found no reference in medical writings to permanent hemianopia or other hemi-defects in migraine, migraine epilepsy, and spontaneous subarachnoid hæmorrhage. I think the cases that present them are worthy of record, because they are not very rare, they cause difficulty in diagnosis, and they seem to me to supply evidence that must be considered in discussions on the nature of the cerebral disturbance in migraine, on the relation of migraine to epilepsy, and on the relation—I think it is an intimate one—between migraine and spontaneous subarachnoid hæmorrhage.

Description of Seven Cases.

CASE 1.—Mrs. A., aged 30, has had attacks of migraine for 11 years. The headache is preceded by zig-zag lights, sometimes on the right, more often on the left side. Two years ago, after a severe attack beginning with lights on the left side, she found that she could not see things clearly on this side. A few weeks later she had a fit and was unconscious for three hours. At the beginning of this year Mr. F. A. Juler found that she had a large left-sided "para-central scotoma of hemianopic type." This persists unchanged. There are no other signs of disease in the nervous system or elsewhere. She has had no more fits; the attacks of migraine have been less frequent and less severe since she began to take luminal a year ago.

CASE 2.—Mr. B., aged 31, has had migraine since the age of 20; a golden rain on the right or left side, sometimes first on one side and then on the other, is followed in about ten minutes by a headache; in some attacks he feels a creeping sensation in the right or left arm. Six years ago he began to have attacks in which "a flushing sensation rises from the stomach to the head"; "he stares and loses himself; he goes right off." Three years ago, after a bad headache, he found that he was blind on the left side and that the left arm and leg were weak. When I examined him first three years ago he had a complete left homonymous hemianopia, definite left-sided pyramidal signs, and some position loss in the left arm. The hemianopia remains unaltered; the other signs have almost disappeared. He is taking bromides and luminal regularly, but still has several attacks of migraine every month, also numerous "flushings"; in two of these he lost consciousness.

CASE 3.—Mr. C., aged 49, suffers from migraine (duration not known); his headaches are preceded by fortification figures; on three occasions during the last 12 years he has had an attack in which the whole of the left side became limp for a few minutes, without loss of consciousness. At long intervals, during the same period, he has had four attacks in which a feeling of numbness in the groins passed slowly upwards to the head; in two of these attacks he lost consciousness for a minute or two, in one for half an hour, and in another for four hours. Three months before he came under observation he felt dizzy and noticed that he could not see things on his right side. He was admitted to the National Hospital, Queen-square, under the care of Dr. Hinds Howell. Examination revealed nothing abnormal except a right homonymous hemianopia.

CASE 4.—Mr. D., aged 26, has had frequent attacks of migraine for seven years. Everything goes misty for about ten minutes, then he gets a headache usually on the right side. Five weeks ago, while at breakfast, he had a "collapse"; it began with misty vision on the left side and pins and needles in the left arm; something rushed from his stomach to his head; he felt very queer and slid down from his chair; he did not lose consciousness, but he had to be assisted to bed. He had a severe headache all that day; during the day he noticed that he could not see things on his left side. A month later Mr. Adrian Caddy mapped out a complete left homonymous hemianopia which just spared the fixation-point. This persists. A complete investigation, including an examination of the cerebro-spinal fluid, revealed nothing else abnormal.

CASE 5.—Mr. E., aged 28, began to have headaches preceded by flashing lights at the age of 13. After one of his early attacks he noticed a persistent black shadow in

the outermost part of the left field of vision; it was there when he covered one or the other eye. Thereafter for about three years he had no more attacks, but the shadow remained. Since the age of 17 he has had an attack about once a month; while the headache was on, and for about half an hour afterwards, a greyness filled the remaining normal portion of the left field. Three weeks ago while at work he saw "a sparkling spangling blur" on the left side for about five minutes; this was followed by the most severe headache he has ever had; it lasted half an hour; after it had subsided he went on with his work; he then found that he could not see things on his left side. He had another headache four days later, otherwise he has felt well. He was admitted to the National Hospital three weeks after the severe attack: investigation, including an examination of the cerebro-spinal fluid, revealed nothing abnormal except a complete left homonymous hemianopia which divided the fixation-point.

CASE 6.—Mr. F., aged 35, has had attacks of migraine for ten years. After one of his early attacks he "lost the sight on the left side" for several days. During the last year he has had three attacks in which the right arm and leg became helpless and numb; this followed dimness of vision, once on the left side, twice on the right, and was accompanied by a feeling of pins and needles which spread from the right hand to the whole of the right side. On two occasions, several days after these attacks, I found a definite extensor response on the right side. While he was in the National Hospital in an interval between attacks the plantar response on the right side was flexor or doubtful. Otherwise there were no abnormal signs.

CASE 7.—Mr. G., aged 31, came under observation for left homonymous hemianopia; this was noticed two years ago, when he went to work after being in bed for three days with severe headache and vomiting. Fourteen years ago he had an illness which was diagnosed as meningitis. His neck was stiff, and he had a very severe headache for two weeks. During this illness "bloody fluid was drawn from the spine with a long needle." The headache on this occasion was "just like the one when the sight went." Seven months ago he had two fits with ten days interval between them; they came on without warning; he lost consciousness, was convulsed, and bit his tongue; they were not preceded by a headache; he recovered completely in an hour or two.

Six days after the onset of the visual trouble Mr. C. L. Gimblett found a complete left homonymous hemianopia which just spared the fixation-point. Eighteen months later the same observer found that some recovery had occurred in the central part of the fields only. When I saw him at this time I found nothing abnormal apart from the field defect, and reported that I had "little doubt that he has a congenital aneurysm that leaks from time to time."

Comment.

I shall not attempt to discuss here the bearing of these cases on the problem of the nature of the cerebral disturbance in migraine and the relation of migraine to epilepsy, but I wish to amplify, very briefly, my statement that there is an intimate relation between migraine and spontaneous subarachnoid hæmorrhage. This conclusion is based on the following set of observations:—

Migraine with classical symptoms of long duration is sometimes complicated by homonymous hemianopia and other hemi-defects, usually left-sided. In these cases, as in uncomplicated migraine, the visual hallucinations appear sometimes on one side, sometimes on the other, but much more frequently on the left side; non-visual sensory hallucinations sometimes precede the headache in cases that ultimately have hemianopia.

Patients with a long history of migraine and epilepsy may, as I have shown, come before us with permanent hemianopia and other focal signs. These may appear (*a*) after an attack of migraine, (*b*) after an attack in which consciousness is lost, (*c*) after an attack unlike these—e.g. with "dizziness" only.

Patients with an exactly similar history may have subarachnoid hæmorrhage. An example of this has so far eluded me, but Symonds[1] has described the case of a man, aged 37, who, "having for 26 years been subject to attacks both of epilepsy and migraine, but otherwise in good health, had an attack of subarachnoid hæmorrhage from which he made a complete recovery." The symptoms in spontaneous subarachnoid hæmorrhage are usually those of diffuse cerebral irritation or compression, but signs of a unilateral focal lesion may be present in the acute phase, focal signs may persist after an acute phase with signs of diffuse meningeal irritation, and a hemi-defect—e.g., hemianopia—may appear suddenly with no more general disturbance than a headache in a person who is known to have survived an attack of subarachnoid hæmorrhage in the past.

Migraine is a not uncommon precursor of spontaneous subarachnoid hæmorrhage. Goldflam[2] obtained a history of "true migraine" in five of 13 cases. Two of my cases—one proved by examination of the cerebro-spinal fluid, the other by autopsy ("congenital" aneurysm)—gave a long history of migraine with right- and left-sided hallucinations. Parkes Weber's[3] patient had migraine-like attacks, chiefly left-sided, for 30 years.

Thus we may expect to encounter the following observed sequences and combinations:—

Migraine, focal signs—e.g., hemianopia.
Migraine, focal signs, epilepsy.
Migraine, epilepsy, focal signs.
Migraine, epilepsy, subarachnoid hæmorrhage.
Migraine, subarachnoid hæmorrhage.
Subarachnoid hæmorrhage, focal signs, epilepsy.

At first sight it might appear probable that these are all due to the presence of a congenital aneurysm whose manifestations vary according to whether it gives rise to circulatory disturbance in its vicinity, short of bleeding, or leaks into the cerebral substance or into the subarachnoid space. It is certain, however, that no aneurysm is present in many of the young people who die of subarachnoid hæmorrhage, and I do not believe that the presence of this lesion is necessary for the production of the symptoms I have described. I am more inclined to conclude that some recurring disturbance of the cerebral circulation whose nature is at present unknown may, in minor form, manifest itself in symptoms for which migraine and epilepsy are convenient labels and, in major form, lead to infarction of the cerebral cortex or hæmorrhage into the subarachnoid space.

I wish to thank my colleagues, Mr. Caddy, Mr. Gimblett, Mr. Juler, Mr. Preston, Dr. Hinds Howell, and Dr. Denny Brown, for permission to refer to their cases and for their kindly assistance.

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THE VASCULAR LINK BETWEEN THE PITUITARY AND THE HYPOTHALAMUS.

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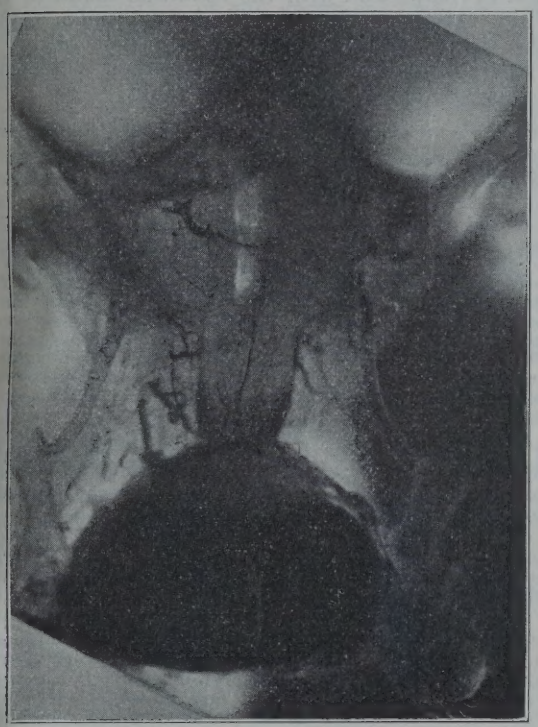
IN the Lister lecture published in the last two issues of THE LANCET, Prof. Harvey Cushing gives a masterly summary of the facts relating to the functional coöperation between the pituitary body and the hypothalamus. Hence a communication which we made to the Anatomical Society of Great

Britain and Ireland at University College on June 20th may be of some interest as affording new evidence in corroboration and extension of Prof. Cushing's argument. Pending the publication of our report on the presence of a hitherto unrecognised hypophysio-portal system of veins, we propose to call attention (by means of a photograph and an explanatory diagram) to the fact that there is a system of vessels which collects blood from both lobes of the pituitary and distributes it to the hypothalamus.

FIG. 2.



Photograph of the pituitary and hypothalamus (cleared in xylol) of another new-born child from the front, to demonstrate the naked-eye appearance of the hypophysio-portal veins in the stalk of the pituitary.

The secondary distribution net lies beneath the infundibular recess of the third ventricle, and there are indications that prolongations extend towards the nucleus paraventricularis and the nucleus supra-opticus.

Fig. 1 represents a graphic reconstruction of the hypophysis of a new-born child which was cut serially in sagittal sections (15μ thick) and stained by the silver nitrate method of Bielschowsky. Fig. 2 is a reproduction of an enlarged photograph of the pituitary and hypothalamus of another new-born child viewed from the front after clearing in xylol. It shows the blood-vessels represented diagramatically from the left side in Fig. 1 (in particular those on the stalk of the pituitary) with which this note is specially concerned, as they are revealed to the naked eye.

In Fig. 1, A is the anterior, and P the posterior lobe of the pituitary, and I the pars intermedia. The vessels numbered 1 are the hypophysio-portal veins arising from sinusoids (7) in the anterior lobe and from capillaries (16) in the posterior lobe. The branches which come from the pars intermedia are not shown in the diagram. On each side the internal carotid artery supplies to the gland a branch (2) which takes a spiral course (3) before opening into the sinusoids (7) from which the hypophysio-portal vessels of the anterior lobe arise. This artery from the carotid also gives branches (15) into the posterior lobe before it enters the anterior lobe. From the anterior lobe veins (4 and 5) leave the pituitary to enter the cavernous sinus (6). In this diagram the cavernous sinus is put below the pituitary merely for the sake of clearness, but obviously this is not its proper place.

FIG. 1.

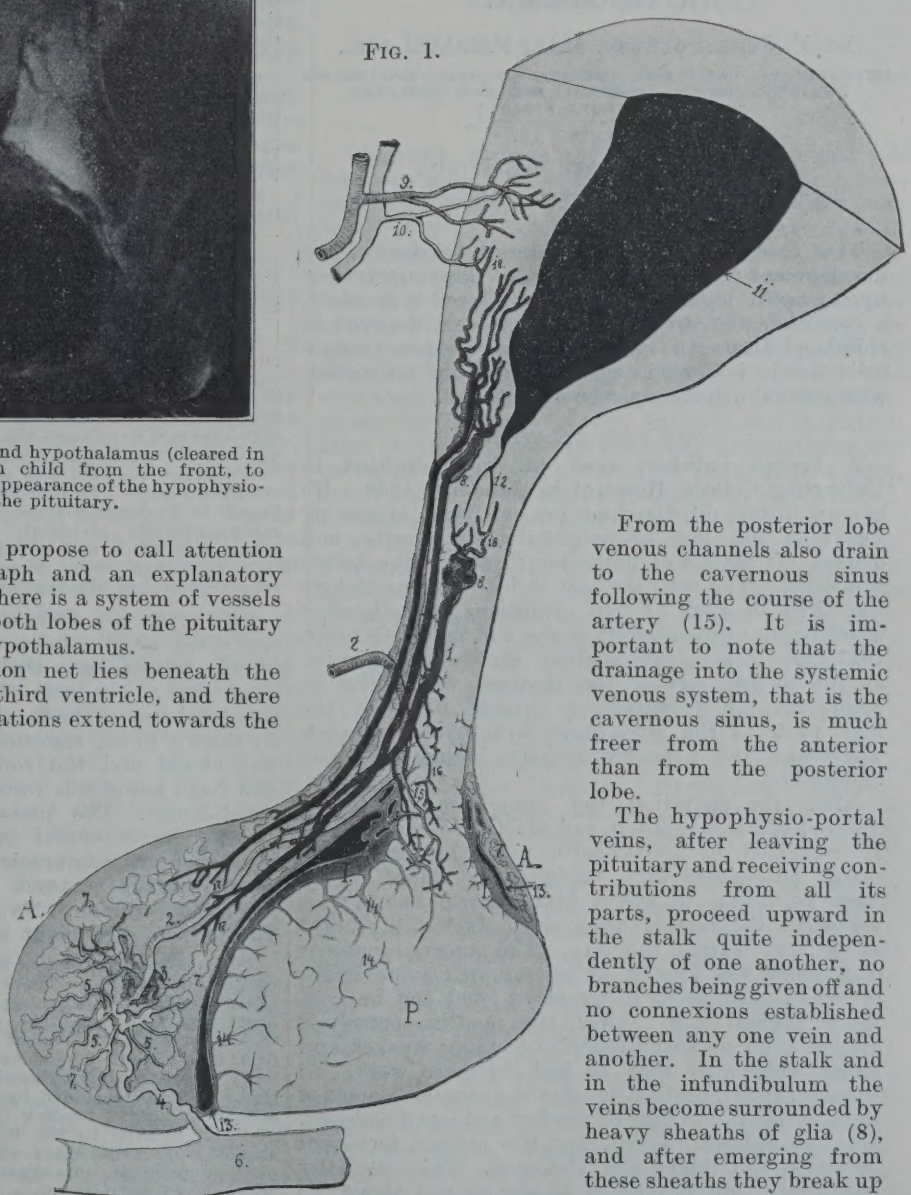


Diagram based on a graphic reconstruction of a series of sagittal sections (Bielschowsky stain) of the hypophysis of a new-born child, seen from the left side

From the posterior lobe venous channels also drain to the cavernous sinus following the course of the artery (15). It is important to note that the drainage into the systemic venous system, that is the cavernous sinus, is much freer from the anterior than from the posterior lobe.

The hypophysio-portal veins, after leaving the pituitary and receiving contributions from all its parts, proceed upward in the stalk quite independently of one another, no branches being given off and no connexions established between any one vein and another. In the stalk and in the infundibulum the veins become surrounded by heavy sheaths of glia (8), and after emerging from these sheaths they break up into a secondary distribution net (18), which is placed beneath the infundibular recess of the third

ventricle (11), and appears to have a definite distribution in the direction of the paraventricular and supraoptic ganglia of the hypothalamus, in which Collin has actually found the colloid substance such as we have found in the lumen of the hypophysio-portal veins. In addition to the arterial supply from the carotid (2) there are small arteries (9) proceeding to the infundibulum, and small veins (10) with a corresponding arrangement, which in some of our cases, although not in the one represented in this diagram, give branches which extend down in the infundibulum to reach the uppermost part of the pars tuberalis of the pituitary, such as Prof. Cushing's colleagues Dandy and Geotsch described in the dog (see THE LANCET, July 19th, p. 125).

Extensive prolongations (14) of glandular tissue from the pars intermedia and pars tuberalis intrude into the tissue of the posterior lobe of the stalk. The cleft (13) is exceptionally large in the young child in comparison with the condition found in the adult. Also the pars tuberalis extends much higher upon the stalk than it usually does in the adult.

Apart from these differences the other statements in this note apply equally to the adult.

CLINICAL AND LABORATORY NOTES

GASTRO-JEJUNO-COLIC FISTULA WITH ŒDEMA.

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THIS case is of particular interest because of the development of a general anasarca. This supervened upon a gastro-jejuno-colic fistula produced in an adult, a condition akin to one which has been observed in childhood during the course of cœliac disease. Gastro-colic fistula is fortunately rare, and its association with general œdema must be exceptional.

THE CASE RELATED.

A French polisher, aged 46, was admitted to University College Hospital in January, 1930. He gave a history of diarrhœa for one year, increasing weakness and loss of weight for six months, and œdema of the lower limbs for three months before admission. The essential fact in his previous history was that in 1902 he had symptoms of indigestion which became progressively worse, and that in October, 1927, an X ray examination showed obstruction at the pyloric end of the stomach with delay in emptying. At operation a chronic ulcer of the first part of the duodenum with pyloric stenosis was found and a posterior gastro-jejunostomy was undertaken.

After the operation the man was completely relieved of his symptoms and started to gain weight. He remained in good health until January, 1929, when he contracted "influenza." Three weeks later he began to suffer from diarrhœa and this persisted, the bowels being open during the night as well as during the day. The average number of motions was four in 24 hours, with a maximum of seven. The appetite remained good and he kept to a normal diet. After six months persistent diarrhœa he noticed himself becoming weaker and losing weight, so that he had to cease work. In October, 1929 (nine months after the commencement of the diarrhœa), swelling of the feet and legs developed. He was ordered to bed, but the œdema increased involving the thighs and abdomen. This gradually improved; but as soon as he got up and about the swelling recurred.

Condition on Admission.—He was a small man, pale, asthenic, and wasted. The most prominent clinical sign was anasarca. There was œdema of both lower limbs and sacrum, free fluid in the abdomen, œdema of the bases of both lungs, and occasional swellings of the face. The heart was not enlarged but the sounds were faint. There were no signs of venous congestion. The pulse-rate was slow, 48 to 80. The systolic blood pressure was persistently low, varying between 90 and 118 mm. Hg. The temperature remained subnormal. The liver, spleen, and kidneys were not palpable. The examination of the urine showed no sugar or albumin.

Progress.—Œdema of both forearms and hands developed. It was noticed that the output of urine was low, averaging 20 oz. a day, but there was no reaction to diuretic drugs.

A urea-concentration test for renal efficency showed a normal percentage of urea in the urine.

A blood count was done and this showed:—

Total red cells	5,500,000	Polymorphs	79%
Hæmoglobin	76%	Lymphocytes	18%
Colour-index	0·7	Large mononuclears	3%
Total white cells	7,100		

The bowels were open, on an average, twice in the day and once in the night. The motions were liquid, dark grey in colour, acid in reaction, and had a foul smell. Culture gave a growth of bacillus only. At first he was treated with kaolin ʒi. t.d.s. As this had no effect on the diarrhœa which seemed to exhaust the patient, he was given a mixture of bismuth and opium. The motions were reduced to one in 24 hours but this was associated with vomiting which occurred once a day for three days. The vomit was then found to be fæcal, and on comparison with the fæces was macroscopically identical. A diagnosis of gastro-colic fistula was made and a radiographic examination showed that an opaque meal passed from the stomach into the transverse colon via the jejunum.

There was no alternative but *operation* and this was done by Mr. Julian Taylor after a preliminary blood transfusion. Owing to the poor general condition and œdema of the lungs, local anæsthesia was employed. The fistula was masked by adhesions so that a block resection was done. The stomach was closed and the continuity of both the small and large bowel was restored by separate end-to-end anastomoses. The mass removed showed a well formed gastro-jejunal opening. One inch distally the jejunum communicated with the transverse colon through a track one inch long, lined with mucous membrane. No jejunal ulcer could be seen. The patient died eight hours after the operation.

Post-mortem examination showed death to be due to acute broncho-pneumonia. There was marked wasting with absence of fat in all tissues; the weight was 7 st. 8 lb. The heart was small and the myocardium atrophied. There was atheroma of the great vessels. The liver was small, firm, and yellow. The spleen was atrophied. The kidneys were congested but otherwise normal. The veins of the limbs were not occluded by thrombosis. There were tough adhesions tightly binding the first part of the duodenum and the pylorus to the hilum of the liver. The healed scar of a duodenal ulcer was present in the posterior wall of the duodenum, immediately beyond the pyloric sphincter which was constricted to a diameter of 1 cm.

Microscopical examination showed myocardial atrophy, severe fatty degeneration of the liver, and that the kidneys exhibited no signs of nephritis. No gross cause for the œdema could be assigned.

COMMENTARY.

About 250 cases of gastro-colic fistulæ are reported in the literature. The common causes are carcinoma of the stomach or transverse colon, and jejunal ulceration following gastro-enterostomy. The occurrence of the latter group is increasing in proportion to the frequency that the operation is done. The exact percentage of the gastro-enterostomies which are complicated by fistula is uncertain, possibly about 2 per cent. Symptoms usually appear within two years of the operation. According to the accounts of Bolton and Trotter[1] and Verbrugge,[2] the main symptoms of this condition in order of frequency are: (1) diarrhœa; (2) vomiting of matter which is sometimes but not always identical with that passed by the bowel; (3) eructation of foul-smelling gases; (4) pain, which may be associated with jejunal ulceration or with subacute obstruction; and is more or less generally distributed over the abdomen; (5) wasting and weakness; (6) appetite remains good. To these symptoms may be added the tendency to fæcal vomiting when the diarrhœa is checked.

In this case diarrhœa and anasarca were the only symptoms apart from general weakness before the patient came under observation, and this indicates that any patient developing chronic diarrhœa after gastro-enterostomy should be investigated for a gastro-colic fistula. An absolute diagnosis may be made by employing the following tests:—

(1) Barium meal or an opaque enema.
(2) The giving of substances by the mouth, the excretion of which is timed—e.g., charcoal biscuits.
(3) The recovery from the stomach of dyes given as enemata.

The œdema in this case showed close resemblance to that which occurred in Central Europe during the late war. Many cases were reported from Germany, Poland, and Austria and Hungary in association with malnutrition. These cases of "war nutritional œdema" have been summarised by Maver.[3] Similar cases were reported from Egypt by Bigland,[4] who also noted the association of œdema with tropical diseases such as dysentery, cholera, and malaria.

The clinical picture exhibited by these cases of "nutritional œdema" was: œdema, usually of the feet and ankles, but also occasionally affecting the thighs, trunk, scrotum, face, and hands, with ascites and hydrothorax; emaciation; muscular weakness; anæmia; gastro-intestinal disturbances; a deficient diet; urine contained no albumin nor sugar; bradycardia; low blood pressure; blood count showed red blood cells 1·5 to 4 million, colour-index greater than one, lymphocytes 30 to 50 per cent.

Hume[5] and Chapin[6] report similar œdema in marantic infants suffering from: (1) Diarrhœa and vomiting. Difficult digestion and malnutrition. (2) Exhaustive conditions such as prematurity, marasmus, and extreme secondary anæmia. (3) In constitutional diseases: syphilis, tuberculosis, and pertussis. Poynton,[7] in a case of fatal cœliac disease, demonstrated that the ascites was not due to tuberculous peritonitis.

Various factors have been suggested as the prime cause in the cases of "nutritional" œdema. Retention of chlorides, lack of calcium and phosphorus in the blood, a diet lacking fresh vegetables, vitamins or protein, or a diet with excess of carbohydrates and water have been each considered the chief ætiological factor. The one common condition in all these cases is semi-starvation, the result of either lack of food or non-absorption due to gastro-intestinal disturbances.

This man was receiving an adequate mixed diet, but owing to the short circuiting of the small intestine, food could not be absorbed. The diagnosis was difficult until the fœtal vomiting occurred and this case brought home very forcibly the importance of a mysterious and persistent diarrhœa following upon a history of gastro-enterostomy for ulcer of the duodenum.

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CHARCOT'S ARTHROPATHY OF THE SACRO-ILIAC JOINT.

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ASSISTANT PHYSICIAN, QUEEN'S HOSPITAL FOR CHILDREN; LATE MEDICAL REGISTRAR, CHARING CROSS HOSPITAL.

Charcot's arthropathy has been described as affecting most of the joints of the body, but I have been unable to trace a record of the sacro-iliac joint being involved. Micheleau,[1] Busche,[2] and Abadie[3] described deformities of the pelvis in tabes, but only as the result of arthropathy of the vertebral column causing changes from the postural attitude of the patient. Bramwell,[4] quoting an abstract from the *Centralblatt f. d. Grenzegebiete der Med. u. Chir.* (August 18th, 1904), says that the iliac crests may show considerable thickening and distortion, presenting a rough uneven surface, and numerous large exostoses. Neither Chipault,[5] in classifying 268 tabetic arthropathies, nor Gowers,[6] in numerous cases, found one in which the sacro-iliac joint was affected. I therefore place on record the following case:—

Mr. A. B., aged 45, a Levantine, consulted me in November, 1928. He was fairly weak, and complained of some sores on his back which had discharged for six months and were increasing in size and number. There were no abnormal symptoms except some irregularity of the bowels. There was a history of syphilis and gonorrhœa about 20 years previously, and in 1921, following a two years' history of pain and chronic obstruction suggesting trouble in the right iliac fossa, laparotomy was done by Mr. G. Gordon-Taylor at the Middlesex Hospital. Hyperplastic ileocæcal tubercle was found, and the terminal foot of the ileum, cæcum, ascending colon, and half the transverse colon were removed.

On examination there was, over the sacrum, a group of typical syphilitic punched-out serpiginous ulcers with yellowish slough in the base. Two thin, slightly pigmented, scars were present over the left tibia. The pupils were irregular in outline and unequal in size, but reacted to light and accommodation. The ankle-jerks were sluggish, the other reflexes brisk; there was loss of deep sensation in the calf muscles, otherwise no sensory disturbance. The Wassermann reaction was very strongly positive. No tubercle bacilli were found in the sputum, fæces, or discharge from the ulcers. Radiographic examination of the pelvis showed the gross hypertrophic and destructive changes in the left sacro-iliac joint, typical of Charcot's disease of joints.

Vigorous antisyphilitic treatment with iodides, mercury, bismuth, and neosalvarsan resulted at first

in great improvement in the general condition and later the ulcers healed completely. The patient is suffering no inconvenience from the pelvic lesion.

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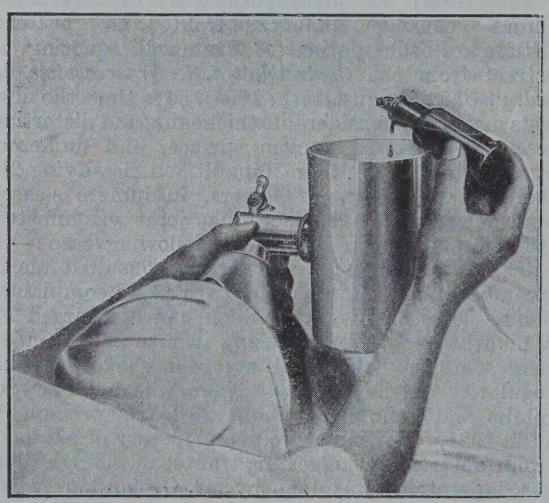
2. Busche, A.: Zeit. für orth. Chir., 1904, xii., 650.
3. Abadie, J.: Nouvelle Iconographie de la Salpêtrière, 1900, xiii, 425.
4. Bramwell, B.: Clin. Stud., Edinburgh, 1909–10, viii., 245.
5. Chipault, A., in Denton and Delbet's "Traité de Chirurgie," Paris, 1896, vol. iii., p. 458.
6. Gowers, W.: Diseases of the Nervous System, London, 1899, i., 460.

NEW INVENTIONS

AN IMPROVED OPEN ETHER INHALER.

THE inhaler shown in the illustration preserves the simplicity of the open method and increases its safety. The gauze-covered mask is placed in a container which is situated at the side of the face and never above it, the lower part of the container being a large well which traps any excess of liquid ether. It is thus impossible for the anæsthetic to get into the eyes of the patient, however freely it is used. The apparatus is made of metal (mostly aluminium), and is less than half the weight of an average Clover's inhaler. The whole apparatus may be boiled. Both the facepiece and the container may be rotated on the connecting tube, thus enabling the inhaler to be

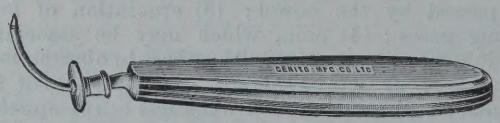


adapted to any position of the head while keeping the container in a vertical position. A tap is fitted for oxygen or carbon dioxide administration when required. The aluminium cage which supports the gauze does not require hinges or retaining clips for its covering, which are weak points in the ordinary type of mask. The component parts are riveted together, thus avoiding the small and flimsy soldered joints of the conventional wire cage. A pad of gauze is placed over the framework, and the whole is slid into the container, which is just large enough to hold it comfortably and just small enough to keep the gauze in position. The apparatus is reasonable in price, compact, and easily controllable with one hand, while there is no mechanism to get out of order, thus enabling the anæsthetist to concentrate solely upon the patient's condition and the surgeon's requirements. Messrs. Reynolds and Branson, of 13, Briggate, Leeds, are the manufacturers.

W. STANLEY SYKES, M.B. Camb.

NEW PATTERN LIPIODOL TROCAR AND CANNULA.

I HAVE been using a special trocar and cannula (see figure) which facilitates and simplifies the little operation for introducing lipiodol into the trachea for getting an X ray picture of the bronchial tree. The instrument is a small curved trocar and cannula mounted on a comparatively large handle at a suitable angle. Curved on the circumference of a circle of 16 mm. radius, the trocar has a sharp point which projects 3½ mm. from the cannula, which is 28 mm. long and 2 mm. in diameter, and has a fixed collar; the trocar is rigid and moves easily in the cannula. The large-sized and comfortable handle contributes



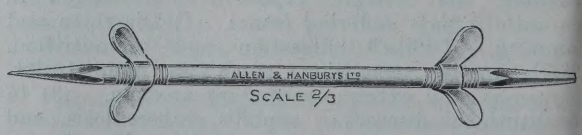
greatly to the control of the instrument and to the precision of the operation. One size only is needed, as the instrument is equally convenient for the largest and smallest trachea. As the result of the X ray examination depends on the quality of the skiagram obtained, which in turn largely depends on good technique, an instrument the use of which tends to secure freedom from coughing, crying, and spasmodic movements of the chest during the operation will go far towards securing with lipiodol a good representation of the bronchial tree. The curved trocar obviates flattening out of the trachea from antero-posterior pressure. In addition to the instrument described it is an advantage to have a tenotomy knife or a small double-edged knife for puncturing the skin.

The instrument was made for me by Mr. R. Schranz, and can be obtained from the Genito-Urinary Mfg. Co., Ltd., of 28A, Devonshire-street, W.1.

J. B. CHRISTOPHERSON, C.B.E., M.D. Camb., F.R.C.P. Lond.,
Physician, City of London Hospital, Victoria Park, E.

AN IMPROVED FORM OF STEINMANN'S PIN.

A MODIFICATION of Steinmann's pin, now in routine use in the orthopædic wards of St. Thomas's Hospital, is here illustrated. It differs from the standard pattern only in that it has a screw thread at each end on to which fits a winged nut. When cords are attached to the pin, the nut prevents their slipping off, and even allows the cords to diverge from the line of the



limb—often a great help in removing pressure from bony prominences distal to the point of insertion. The ordinary insertor handle is used with a screwing motion while the thread is traversing the bone, and the time taken therefore is slightly increased. Nitrous oxide anæsthesia still suffices for adults, while, as previously, gentle extraction requires no anæsthetic.

Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, are the manufacturers.

JAMES H. CYRIAX, M.R.C.S., L.R.C.P. Lond.

THE NEW MENTAL TREATMENT ACT.

CONFERENCE OF LOCAL AUTHORITIES.

On July 22nd and 23rd the Board of Control convened a conference of local authorities and visiting committees to discuss new administrative questions raised by the Mental Treatment Act, 1930. The chair was taken by Mr. L. G. Brock, Chairman of the Board of Control, and Mr. Arthur Greenwood, the Minister of Health, addressed the congress on the second afternoon. Mr. Brock emphasised the fact that, although for purposes of discussion the Act was regarded in sections, it was one coördinated piece of machinery.

At the first session, Dr. T. S. Good opened a discussion on "Out-patient Clinics," and described the origin and working of the clinic at Oxford. He argued for the establishment of clinics in connexion with general hospitals, and said that, although the admission-rate at the Radcliffe Infirmary and the general population of Oxford had increased, yet the number of mental patients chargeable to the city and the admission-rate at the mental hospital had appreciably diminished since the opening of the out-patient clinic. Reference to this discussion will be found on p. 247.

At the next session a discussion on "Voluntary Patients" was opened by Dr. Thomas Beaton, and at the final session there were short discussions on research, after-care, and the extension of the urgency order to rate-aided patients.

Treatment of Temporary Patients.

At the third session Sir Hubert Bond opened a discussion on Temporary Patients under Section 5. This section, he said, might almost be regarded as the pivot upon which the successful working of the Act rested. It abolished magisterial intervention for a period long enough to allow effective treatment; it abolished certification as an essential preliminary, and thus provided a direct stimulus to immediate treatment; it did more than any other legislative step in the last century to compose the differences between the medical and legal attitudes, and it created a new class of patient intermediate between the voluntary and the certified. The period allowed for temporary treatment was six months, extendable by the Board of Control to a maximum of 12 months. It was most important that no attempt should be made to strain the words of the Act to cover patients who were, in fact, unwilling and who ought to be certified. Since the visitation by a justice within a month of reception had proved unavoidable, it must be obeyed loyally. Sir Hubert urged everyone, however disappointed he might feel, to do his utmost to prove the Act a success, and to avoid awkward incidents. It was important that the patient should be seen by the official visitors in his bed or his own ward, and questions of procedure and status should never be discussed in his hearing. The condition covered by "the temporary status" often arose very suddenly, as in the puerperium or during toxæmia, but it might also arise in a patient already under care. If the patient were certified, there would be no call to change his status; if he were voluntary and lost his capacity to express his willingness to continue treatment, he must be discharged, certified, or placed on a temporary basis after 28 days. To avoid a feeling afterwards of unfair treatment, judicious chats with a voluntary patient were useful to inform him, without alarming him, of the possibilities inherent in mental illnesses. Nevertheless, difficult cases were bound to arise. The form of application was quite different from a certificate and the safeguards were not identical with those under the Lunacy Acts; they should, therefore, be studied carefully by medical officers. There was no restriction on the place of reception of the patient, except the approval of the Board of Control, but local authorities were under a very real moral obligation to provide active, up-to-date treatment. It was most important to nip in the bud the pernicious tendency to speak of "voluntary," "temporary," and "certified," as though these grades represented grades of severity of illness with corresponding inverse grades of recoverability and standards of accommodation and treatment. This tendency would kill the prestige of mental hospitals, mutilate their functions, and do incalculable harm to treatment. It was, however, part of the moral obligation of local authorities to provide for incipient and recent cases accommodation apart from chronic cases. In view of the new Act, there was an urgent need for the provision of an admission unit to all mental hospitals. Something in the nature of a bridge was needed between the home and the mental hospital; this "bridge" should have adequate laboratory facilities and, although it might serve as an observation centre, must emphatically not be regarded as a clearing-house. Its chief physician should be the physician in charge of the mental hospital. Its location was a matter for discussion, but undoubtedly the best place would be in close connexion with the local voluntary hospital.

THE PREPARATION OF THE APPROVED LIST.

The Chairman announced that the Board of Control, in order to perform its delicate task of drawing up lists of approved practitioners, had appointed a medical committee with Sir John Rose Bradford as President, and representatives of the Royal Medico-Psychological Association, the British Medical Association, and the Royal Society of Medicine as members. The Board would be represented by Sir Hubert Bond and Dr. A. Rotherham. He further pointed out that the section contemplated the reception of temporary patients into general hospitals which had been approved by the Board. This provision would have the great advantage of leading to a closer association between the general, voluntary, and mental hospitals, and between psychiatry and general medicine. It would be of especial value in cases complicated by obscure physical conditions, because the general hospital contained a medical team such as the mental hospital could not provide, and the study of these cases was likely to throw much light upon the relations between mental and physical disease. Moreover, the introduction of mental patients into teaching hospitals would give the student opportunities of clinical experience hitherto denied to him. The arrangements would not be uniform over the whole country and the change could not be made immediately, but it was important that the minds of all concerned should be focused at once on the project.

DIFFICULTIES.

Dr. W. F. Menzies mentioned a few of the difficulties of Section 5. In North Staffordshire the voluntary hospitals were not anxious to receive mental cases. He asked who were to make the recommendations, one of which called for a specialist's knowledge; there were not enough psychiatrists in the country to go round. It had been suggested that the medical officer of health's assistants should undertake the duty, and it was very hard to persuade a committee

that the mental deficiency expert was not necessarily an expert in curable mental disorders. It was also suggested that panel practitioners, who had given good service as recommenders of licensed houses, should give the second recommendation. This arrangement would obviously not work. The public assistance officer, again, had a magnificent record, but was not a medical expert. Dr. Menzies said that he would like to see the family doctor as one recommender and the medical officer of the mental hospital as the other. The mental hospital officer should, if possible, give the recommendation without going to see the patient, but it was doubtful whether a temporary patient could be legally brought to the asylum to see him. The second question was where the patients were to come. He was afraid that the place would be the "lunatic ward" of a workhouse. He asked local authorities, until special small collecting hospitals had been built or beds allotted in general hospitals, to bring patients straight to the mental hospital. He did not think that any more beds would be required, or that the local authorities would be put to any extra expense. Only 17 per cent. of the recent admissions to Cheddleton could possibly have been included as temporary patients. All needs would be supplied by the admission blocks now being built in all mental hospitals. He appealed to members of local authorities where the mental hospital officer was not a municipal officer not to be too much influenced by their clerks.

The CHAIRMAN remarked that Dr. Menzies had assumed that the approved practitioner must necessarily be something of an expert. This was not so. The clause providing for approval had been inserted by the House of Lords as a safeguard to the liberty of the subject; the recommending practitioner was only required to be someone of acknowledged standing. The kind of man required was that general practitioner of especial experience and capability who was normally called in by his colleagues to give a second opinion.

Dr. T. C. GRAVES observed that under the section a hospital might have to release the temporary patient who was not really fit to go out, but the responsibility did not then rest upon the hospital, any more than it did upon the general hospital in analogous conditions. The classes of patients who, although they were still seriously ill in mind and body, had volition, demanded serious consideration. If it was required to certify a patient he should first be removed from the mental hospital, except when acute mental symptoms dominated, and special reference had to be made to the Board. The aim of the section was to avoid certification, but in some cases the health of the patient demanded it. When patients recovered health they were not as a rule disposed to quarrel with the means by which they had recovered it.

MENTAL AND VOLUNTARY HOSPITALS.

Mr. F. L. BLAND, Chairman of the Suffolk Committee, spoke of the practical difficulties of coördination. It was for the layman to secure close coördination between the mental hospitals and the voluntary hospitals in the area. Most of the voluntary hospitals were short of money and situated in the middle of big towns—not the best place for mental patients. Their sites were very often not large enough for rebuilding. Financial assistance would be refused as the thin end of a bureaucratic wedge. Nevertheless, coöperation was vital not only with the large voluntary hospitals but with the small, in association with which it might be possible to establish out-patient clinics.

Dr. H. DOVE CORMAC thought that the proportion of non-volitional patients was much less than 17 per cent. He asked whether it was necessary to examine patients every day to see if they had recovered volition and, if they had, whether it was necessary to inform the Board or record the fact in any way at the start of the 28 days' interval. He asked whether the usual report had to be sent to the Board at the end of the first week after admission. He had found the general hospital to be, on the whole, inimical towards the mental hospital.

Dr. J. MIDDLETON MARTIN said that the Gloucestershire County Council had satisfactorily coöperated with and contributed to its voluntary hospital. He asked whether the omission of any provision for the local authority to send a patient into single care had been intentional.—The CHAIRMAN replied that it had been intentional, because no such need was anticipated.

Dr. J. F. DIXON foresaw the disappearance of the voluntary system, but recommended an expectant and hopeful attitude.

Councillor W. LOCKE, J.P. (Newcastle), said that the man in the street knew nothing of the advantages of the Act; he knew that his family did not come into the National Health Insurance scheme, and wondered if he would have to pay for their mental treatment if they were passed on through the public assistance committee to a general hospital or mental hospital. Publicity was essential.

Dr. R. W. GILMOUR advocated the voluntary system, because the patient's relatives nearly always desired to retain control. It would be unfortunate if matters could not be arranged with relatives independently of the Lunacy Act.

Dr. MARY BARKAS warned the meeting not to confuse the temporary patient with the borderline case, who was eminently suitable to be a voluntary boarder. Lay committees should realise that the non-volitional patient was essentially the acute case, and as disturbing to voluntary boarders as the most advanced and degraded chronic patient. Temporary patients needed the most expert nursing and medical attention; they were not cases for students to experiment on, or for junior house physicians to treat. They should not, for the sake of eye-wash, be denied the expert treatment which only a mental hospital could give, and accommodated in what would be very little different from the present workhouse infirmary observation ward. The ideal institution was perhaps a clinic such as the Maudsley, in close touch with a large general hospital, but this was only possible in very large centres, and could not cover the requirements of a scattered and poor community. She disliked the institution of visiting justices. She feared that if the mental hospital officer were the person to grant the recommendation he would always be regarded with suspicion by voluntary boarders.

Councillor Mrs. EVA HARTREE (Cambridge) said that the public could best be educated through voluntary educational societies. The only men's societies of the kind she could think of were the Rotary Clubs and the Y.M.C.A., but there were numerous institutions for women.

Dr. P. T. HUGHES recommended that the public assistance committee should start a neurological department in a convenient workhouse infirmary in consultation with mental hospital officers. Otherwise the county council could approach the general hospitals and be responsible for the cost of the new buildings.

Mr. S. J. F. MACLEOD, K.C., counsel to the Board, dealt with some of the legal points that had been raised.

REVIEWS AND NOTICES OF BOOKS

Old Age: the Major Involution: the Physiology and Pathology of the Aging Process.

By A. S. WARTHIN, Professor of Pathology in the University of Michigan. London: Constable and Co. 1930. Pp. 199. 15*s*.

The Creed of a Biologist.

Same author and publisher. Pp. 61. 7*s*. 6*d*.

THE appearance of a book on old age by a pathologist of the standing and experience of Prof. A. S. Warthin is naturally something to which we should look forward with a lively anticipation of sound observation and wise deduction. Nothing is, in fact, needed more in pathology than a careful analysis of the ageing process in man, based on the ascertained facts of morbid anatomy. Now that men and women live so long, medicine is concerned more and more with the reactions to injury of bodies which have passed their prime and are in one way and another already more or less decayed. We want, therefore, very much to know exactly how the body at 60 and at 90 differs from the body at 25 and, at the other end, why few people can play Rugby football after 30, and why it is remarkable that Tilden should win the lawn tennis championship at 37. Prof. Warthin's account helps us very little to understand these things, and, frankly, we find it disappointing. Of facts there are very few; spermatogenesis is dealt with in some detail, but for the most part we look in vain for the concrete results of Prof. Warthin's autopsy experience. We should be glad, for instance, to know the numerical basis for the statements on pp. 41–42 that the increase in the sizes of viscera between 30 and 40 are due to hypertrophy rather than hyperplasia. There is a strange inconsistency between the statement on p. 147 that all the examples of intrinsic senile death which Prof. Warthin has personally examined were due to myocardial atrophy and inadequacy, and that on p. 157, where he says "death in man results from the death of the central nervous system, which always dies first." On p. 82 he says "the functional curve for the central nervous system rises continuously from birth until about the seventieth year," and on p. 83 he affirms that at the time when senescence is first perceived "the only function curve that shows any decided decline is that of the reproductive function." He nowhere considers the capacity to do muscular work of a refined and coördinated kind—e.g., to run—as a function worth consideration, though there is no human capacity on which man depends more for his survival.

The book, as we read it, is not a serious contribution to pathology but a bright and readable exposition of the simple fact that old age is bound to come and cannot be avoided. It can be understood better if it is read in conjunction with another book which Prof. Warthin has recently published—"The Creed of a Biologist"—in which he preaches that the whole duty of man is to select a wife on the best eugenic principles, have three or four children, and bring them up properly. From that point of view the demonstration that tissues isolated by themselves in artificial culture are immortal, senescence being a function of the body as a whole, is immaterial, and Prof. Warthin brushes it on one side as meaningless.

Treatment of Chronic Arthritis.

By A. H. DOUTHWAITE, M.D., F.R.C.P., Assistant Physician and Physician in charge of the Massage Department, Guy's Hospital. London: Jonathan Cape. 1930 Pp. 127. 5*s*.

So much has been written on arthritis that it is refreshing to find a physician approaching the subject from a different angle—that is to say, with a full appreciation of the important part the surgeon plays in a condition which can be considerably relieved by appliances, manipulations, and occasional operations. The opening chapters are conventional, the sections on pathology, ætiology, and clinical features following the inevitable familiar course; a clear distinction is made between infective arthritis and rheumatoid arthritis. If every doctor read and assimilated this teaching, possibly healthy teeth and tonsils would not be so ruthlessly removed from obedient owners. Again, the division of rheumatoid arthritis into three stages is most useful, with a suitable line of treatment indicated for each stage. There can be no doubt that much harm is done by applying the same treatment to the condition, whether it be active, subacute or chronic, and incidentally the patient's sufferings may be much increased. In discussing treatment the author suggests that deep X ray therapy in the treatment of osteo-arthritis has possibilities that have not yet been fully explored. He suggests a method for applying thermal treatment which is little known but is well worth considering—namely, the painting on of layers of hot wax. For vaccines Dr. Douthwaite has little use, and he considers their administration unjustifiable in the absence of sepsis; in his view "probably the greatest objection to vaccine therapy is that it deludes the physician and patient alike into the belief that something active is being done for the disease, which in the meantime pursues its remorseless course."

Throughout the work notes are introduced on recent research into arthritis, and the reader is thus made familiar not only with modern methods of treatment but with the investigations being made on the biochemistry and pathology of the arthritides. This book can be warmly recommended.

Les groupes sanguins schêmas et applications pratique.

LA TRANSFUSION SANGUINE, TECHNIQUE ET INDICATION. Par PAUL MICHON, Médecin des Hôpitaux de Nancy. Paris: Masson et Cie. 1930. Pp. 120. Fr.16.

THIS small handbook is intended for the practitioner, and is not overburdened with historical or with theoretical considerations. The first portion is concerned with the blood groups, and describes the fundamental facts, the various agents responsible for agglutination, the methods of determining the blood groups, and their biological and medico-legal aspects. The author describes a simple method of testing on a slide, but advocates the use of stock sera of three groups, II., III., and IV., instead of the usual II. and III. The second portion of the book deals briefly with the practical side of blood transfusion—choice of blood donor, technique of the operation, the therapeutic action of transfusion, and

indications. There is also a short bibliography. It would scarcely be possible to compress the subject into a smaller space than this book, but within its limits the essentials are clearly described.

Handbuch der Ernährungslehre.

Vol. II. Spezielle Diätetik der Krankheiten des Verdauungsapparates; Part I., Magen. By CARL V. NOORDEN and HUGO SALOMON. Berlin: Julius Springer. Pp. 460. M.39.

THE title of this book is misleading, for it understates the scope and underestimates the value of the contents. Instead of being a mere treatise on the dietetics of gastric disease, the work is really a portion of a text-book of medicine in which the subjects are dealt with principally from the standpoint of treatment, but with due reference to the essential facts of causation and symptomatology. The section on gastric and duodenal ulcer, which takes up 50 pages, is a typical example. After a short but adequate summary of the ætiology of peptic ulcer, its diagnosis by X rays and chemical tests, and its symptoms, there follows a detailed description of the management of a case, from the time the patient consults the physician for pain or hæmorrhage, through the treatment of the florid ulcer by diet and medicines, until a successful result is obtained by medical or surgical means. Indications for operation, decision as to type of operation advisable, and the after-treatment of ulcer cases, whether operated on or not, are discussed. Gastritis, acute and chronic; alterations of secretion, whether of excess or defect; cancer; dilatation of the stomach, and those conditions classed as nervous dyspepsia, are dealt with in a correspondingly exhaustive manner. The book contains an excellent account of the present-day knowledge of the physiology of digestion in the mouth and stomach; and each section provides a bibliography of the standard works in the various European languages, together with recent papers incorporated in the discussion in the text. The book, which has a good index, will provide accurate and considered information for all workers in the subject of gastric disease.

A Manual of Diseases of the Eye.

Sixth edition. By CHARLES H. MAY, M.D., Consulting Ophthalmologist to the Mount Sinai Hospital, New York; and CLAUD WORTH, F.R.C.S., Consulting Surgeon to the Royal London Ophthalmic Hospital, Moorfields. London: Baillière, Tindall and Cox. 1930. Pp. 475. 15*s*.

THE first English edition of this book appeared in 1906, and since that date there have been more than a dozen reprints or new editions. The teaching is sound and the illustrations adequate, and yet the student who relies exclusively on the information to be derived from this work may have cause to regret that he did not supplement it by attending a good ophthalmic clinic where the teaching is quite up to date. Revision of a work that was quite adequate a quarter of a century ago is a very difficult task if it is desired to keep pace with recent advances in ophthalmology. To give two instances: rheumatism and gout, as well as auto-intoxication from the septic foci in the body are all mentioned as possible causes of iritis, but the student is not told that nearly all the cases that used to be attributed to the first two causes are now generally put down to the third. But in a later chapter, on the ocular manifestations of general disease, this very point is stated clearly in accordance with the modern view. Again, in the chapter on cataract the traditional account of the structure of the lens as consisting of nucleus and cortex is given. It is only in a separate chapter by Mr. Harrison Butler, written especially for this edition, on the slit-lamp and corneal microscope, that we find the modern discoveries of the nature of the lens structure described. Indeed, perhaps the most interesting parts of the book are the chapters specially written for its different editions. The late Mr. Devereux Marshall's account of Dr. Edridge-Green's theory of colour vision is the best to be found outside the latter's own writings; Mr. Sydney Browning's chapter on vaccines in ophthalmology is also excellent. The chapter on squint gives, as we should expect, a useful summary of Mr. Worth's personal teaching on a subject which he has made his own. We observe that in discussing the operative treatment of convergent squint he speaks disparagingly of the operation of recession of the internal rectus muscle by means of a suture, a procedure which, whether or not combined with an advancement, has been growing in popularity with many ophthalmic surgeons in recent years.

Chirurgie des os et des articulations des membres.

Par P. LECÈNE, Professeur à la faculté de médecine de Paris. Avec la collaboration de P. HUET, chirurgien des hôpitaux de Paris. Paris: Masson et Cie. Pp. 591. Fr.140.

THIS work was nearly finished when the outbreak of the Great War delayed its publication, and wisely deciding that his views and practice required modification in the light of his war experience, Prof. Lecène held it up for revision. The result is a treatise on the surgery of the bones and joints of the extremities which is in full accord with the most modern views and practice. The first section deals with the operative treatment of both simple and compound fractures. Operations for malunited fractures, which in this country at any rate constitute the major problems of fracture surgery, receive but scant attention. The section on osteomyelitis is admirably written, but that on bone tumours would have been much improved by illustrations. The fourth section deals with wounds of joints and operations on joints, and is undoubtedly the best in the book, both in text and illustration. The section on tuberculosis of bones and joints is unsatisfactory, since it is limited to operative indications and measures. The section on amputations is good; it includes a useful chapter on artificial limbs. Excisions are dealt with on orthodox lines. The last part of the work is devoted to the surgery of bone and joint deformities, and is far too short to do justice to such a wide subject.

The work makes no pretension to being a book on operative orthopædics, for it is deliberately limited to the operative treatment of bone and joint conditions. Within these limits it is very useful, and the author is to be congratulated on the fair manner in which he presents his own views and those of others on the problems concerned.

ST. PETER'S HOSPITAL, COVENT GARDEN.—Lady Ravensdale recently opened a new out-patients' department, pathological laboratory, and nurses' quarters. These improvements, and others in progress or contemplated, will cost £24,000.

THE LANCET.

LONDON: SATURDAY, AUGUST 2, 1930.

OUT-PATIENT CARE OF EARLY MENTAL ILLNESS.

THE Mental Treatment Act, 1930, which becomes law on the first day of January next year, marks a great advance in the attitude of the legislature to mental disorder. It throws upon local authorities and visiting committees many duties which have not hitherto been obligatory and some of which have actually been forbidden. The Board of Control therefore called a conference to discuss the new situation practically, for, as the Chairman of the Board pointed out, this is no time for vain regrets that the Act is not moulded nearer to the heart's desire of the psychiatrist. Compromises were inevitable if the Bill was to become law, and the duty of experts now is to cultivate the ground that has been gained and to educate public opinion so that further concessions may be justified in the near future.

Typical of the spirit of the advance is the clause which empowers local authorities to make arrangements for the treatment of out-patients, and on this the Conference heard many of the opinions reported in THE LANCET.[1] Hitherto, as Prof. G. M. ROBERTSON remarked, visiting committees and medical officers have been concerned with the care of the certified; in future they are to be responsible also—and even primarily—for the prevention and early treatment of mental disorder. To accomplish this task successfully two things are essential: the confidence of the patient and the coöperation of the general practitioner. As Dr. T. S. GOOD and Dr. R. W. GILMOUR pointed out, the patient is always terrified. He describes his fear as the fear of going mad, but is often unable to explain what this means. Behind it lies the fear of being "shut up." That fear must be expelled before anything can be done. For this reason the general consensus of opinion was in favour of receiving mental out-patients at general hospitals. Once they have seen the psychiatrist there and realised his power to help, they will gladly see him again elsewhere, even at a mental hospital. Often enough they will be quite willing to enter a mental hospital under his care. The out-patient department, as Dr. GOOD observed, is the source of the voluntary boarder. Thanks to the new Act, medical superintendents will no longer have the painful experience of having to refuse admission to early cases until they have become so much worse that they are certifiable. Dr. R. EAGER said frankly that he had found the old Act a great obstacle to the early treatment of mental disease. Another cogent reason for making the psychiatric clinic part of the general hospital out-patient department is that advice and treatment are there available for any part of that complex organism which the psychiatrist must never forget to view as a whole. A difficulty in rural areas is the distance that some patients have to travel to reach a large hospital. Sir WILLIAM LOBJOIT suggested the cottage hospital as a solution of this problem, while other speakers recommended that travelling expenses should be provided; in Exeter this is done out of a benevolent fund. To ensure the interest of the general practitioner Dr. GOOD advised the psychiatrist to go about among his professional brethren, while every speaker emphasised the importance of writing to doctors who send patients to the clinics, giving them a full report and full instructions. As Dr. A. A. W. PETRIE pointed out, the local practitioner wants to be told just exactly what to do with the mental cases that remain under his care, and, as Prof. ROBERTSON said, simple physical measures are often adequate treatment but will not be adopted unless advised by someone with authority and experience. In Worcestershire, according to Dr. P. T. HUGHES, the local profession is anxious for the establishment of clinics, while other speakers admitted regretfully that the practitioner was apt to be as suspicious and mediæval in his attitude as the laity. This difficulty, at any rate, is likely to die out, for the undergraduate of to-day is showing much interest in psychological medicine.

To local authorities the economic aspect of this problem is inevitably of great importance. The general opinion was best summed up by Sir HUBERT BOND, when he said that in all the realm of medicine no better value could be obtained for money than in the psychiatric out-patient clinic. For the establishment of a clinic nothing is needed save a waiting-room, a consulting-room, a doctor, and a nurse. The services of doctor and nurse should cost nothing, as they should be regarded as part of the duty of the staff of mental hospitals. The hospitals should be made to realise, said Dr. A. T. FORRESTER, that all that is asked of them is chaperonage. As soon as the clinic is established, however, the need for beds at once becomes apparent; these can be provided in mental hospitals if chronic cases are transferred to poor-law institutions under the Local Government Act, 1929, but an even better arrangement—most speakers felt—would be for the general hospital to allot beds to their psychiatric clinic. Many apparent objections to this scheme have been shown to be groundless by the experience of the Middlesex Hospital, where functional nervous cases, including even violent and suicidal patients, have been successfully nursed by the ordinary staff in the general neurological ward. Another great need of the clinic, and one involving small expenditure, is the social worker. Miss EVELYN FOX, emphasising the necessity for a specially trained and experienced woman, said that the Central Association for Mental Welfare is proposing to arrange for the provision of these helpers to local authorities. Finally, and most important of all, comes the problem of the personality and training of the psychiatrist. On that everything depends. Dr. J. R. LORD, pleading for better psychiatric education, said that patients had had far too much patting on the back and simple physical treatment.

[1] THE LANCET, July 19th, p. 137.

They required the most skilled psychological handling and in that way alone would the clinic prove a real saving of money. Without it the pessimist, who said that the numbers saved from certification would be small, might indeed prove right. Each new case needs about an hour for satisfactory examination, and it is impossible for half a dozen medical officers from the county mental hospital to serve clinics for the whole area. Birmingham University is hoping to provide a training centre in psychiatry for practitioners and any of the organised clinics will be glad to receive doctors for training, but there is undoubtedly an inadequate supply of reapers for the harvest which is ready. The handling of early mental disease is not a matter that can be learnt from books. While there must obviously be some who are unfitted for the work, Sir HUBERT BOND enunciated a great truth when he said that the man who wants to do it, but is appalled at the difficulties and his own inadequacy, is the man who should go ahead, for he will do well.

BACTERIAL VARIATION.

IN the early years of bacteriology bacteria were supposed to be extraordinarily variable and capable of a series of transformations which no one would believe in nowadays. The allegations that a bacterium was a stage in the life-history of a higher fungus or that it might change into an alga no doubt originated in imperfect methods and impure cultures. As a proper corrective and in the necessary insistence on a rigid technique opinion swayed too far, as we see now, in the other direction; even mild pleomorphism became suspect and every species was supposed to conform to a certain fixed set of characters. Bacteria became, indeed, about the least variable group of living things, which would be very remarkable if it were really the case, for they occur in larger numbers and multiply faster than any other animals or plants. This view did not, of course, actually represent the facts of observation and experiment, and in the last 20 years, since bacteriologists have attended to the matter and observed what they saw, it has been realised that bacteria vary freely in various directions in ways which are mostly ill-understood. It is timely that the last volume to be issued (Vol. I.) of the "System of Bacteriology," published under the auspices of the Medical Research Council, contains a critical survey of the subject by Dr. J. A. ARKWRIGHT, who has himself contributed so much to the elucidation of the variations of meningococci, dysentery bacilli, and the typhoid group.

Recognisable varieties fall naturally into two large groups: those which are temporary, due to the environment, and will revert to the normal standard as soon as standard conditions of life are resumed; and those which are relatively permanent and heritable. It is this second class which is of particular interest and importance. They arise definitely and more or less suddenly and they are not easily reversible; hence they are often called "mutants," on the analogy of the apparently similar genetic changes which occur in higher animals and plants. The term is not a good one in bacteriology and is best avoided, since by implication it connotes a chromosomal constitution which has not yet been seen in bacteria. Practically all the perceptible characters of bacteria are known to show these hereditary variations—the shape, flagella, capsule formation, the form of colonies on solid media, the mode of growth in broth, the fermentation of carbohydrates, the formation of indol, virulence, antigenic properties, and so on. The definition of a "species" is often difficult, as Sir FREDERICK ANDREWES points out in another chapter of the same volume, but there is no doubt that the criteria of differentiation are to be found in the assemblage of characters possessed by any bacterium rather than in any single quality. Any one of these characters may vary and several may vary together, but for all that there is no clear instance where variations have, as it were, changed one "species" into another. The plague bacillus hardly differs from the pseudotubercle bacillus except in its pathogenicity, and the two are quite likely variants of what is essentially the same thing; since, from the human point of view, one is important as a pathogen and the other negligible, they have been classed as two "species." But such cases are very rare and the study of variation has given no support to the idea that one kind of bacterium may be changed into another. The pseudotubercle bacillus may possibly be a non-pathogenic form of the plague bacillus, but the transformation of one into the other has never been observed. Practical considerations do, however, arise. The non-pathogenic variants known as "rough" forms are generally found to appear in old cultures under conditions where some form of degeneration would be, a priori, not unlikely; the virulent "smooth" forms are commonest in cultures recently isolated from the body. The change from smooth to rough has often been seen, that from rough to smooth much more rarely. But it seems quite likely that the rough type represents the wild or saprophytic form of the species, and that its acquisition of parasitic virulence is associated with the change to the smooth type. Hence we have the obvious possibility of the appearance of a pathogen apparently de novo. Some of the hereditary variations are adaptive in the sense that they are caused by and distinctly related to something in the environment; the typhoid bacillus, for instance, "learns" to ferment dulcite by growing on media containing dulcite. So we may suppose that the acquisition of the parasitic habit is caused by coming into contact with a specific live animal. And under certain conditions a change from rough to smooth has been observed in these circumstances.

Our only regret about Dr. ARKWRIGHT's account is that he has not enlarged upon the more general biological implications of his facts. Owing to their exceptionally quick multiplication bacteria form unique material for evolutionary studies, and this is only partly offset by the impossibility of examining a population individually. Still,

it seems that adaptive variation is among their possibilities ; if that is so, the effects of progressive selection become almost impossible to study. And the interesting consideration arises whether selection and adaptive variation are not really the same process.

THE FATE OF THE ROYAL VETERINARY COLLEGE.

THE position of the Royal Veterinary College, as revealed last week in the House of Lords (see p. 274), is a discredit to the nation. Lord HAREWOOD said, giving figures as well as facts, that many of the buildings were dilapidated and irreparable ; that the money available for acquiring the site, for rebuilding, and endowment was a sum which, even with the large assistance promised by the Government, would be inadequate ; that the chances of the College authorities raising the further sum needed, including the automatic increase of Government assistance, were hopeless ; and that unless a larger offer should come from the State further students could not be taken. In other words, he showed that the College would cease to exist when the curriculum of the existing students is completed. This is a state of affairs that seems almost incredible in Great Britain, and in connexion with the capital of the Empire. Our national claims for pre-eminence in the scientific breeding of agricultural stock are not in dispute, but none the less this important school for the appropriate training of veterinary surgeons is in peril of decease. For Lord DE LA WARR, as the mouthpiece of the Government, was unable to hold out any hope of increased assistance.

There never was a time in the history of medicine when veterinary study, whether in its widest or most detailed conception, was more directly allied to the science of medicine than to-day. It is unnecessary to point out how deeply and how broadly modern medicine, alike from the preventive and curative aspects, is allied to the right comprehension of the physiology and pathology of the animal world. Such an imminent threat to the progress of veterinary medicine is a matter that concerns the whole of the medical profession ; much medical and surgical research will be impeded, as will be the progress in different directions of public health development and the organised study of dietetics. At the Royal Veterinary College the students get a thorough clinical experience from the care of thousands of sick animals which are brought to the College for diagnosis and treatment ; and no other College can boast of equal facilities for enabling the students, as and when their equipment reaches the proper level, to take an active part in dealing with their animal patients. They have the opportunity to see, diagnose, and treat many obscure conditions in a way that is only possible at an institution which is the focus of large endeavours. The statistics of the operations performed with good result would make surprising reading for most people, while this average of success implies labour and resourcefulness that should be needless, because of compulsion to employ inadequate apparatus. Stock and special vaccines are regularly prepared at the College, there is prompt post-mortem examination of carcasses submitted for the purpose, and pathological specimens are daily reported upon. All this work is in successful course under poor conditions, proving that the Metropolis is a fitting centre for such activities, even when they are carried on without due equipment.

While setting out the hope that some way will be found of avoiding the disgrace to us all of allowing the College to remain in its present critical plight, it is pertinent to point out that its transference, for economical reasons, to a site in the country would not meet the case. Removal from a centre where large and variable clinical material is always forthcoming and where, if the money were provided, facilities for teaching and for research would be at their highest level, must be a retrograde step.

CANCER: A GEOGRAPHICAL SURVEY.

APART from the valuable statistical reports on cancer, of which the latest is summarised on p. 260, several memoranda have been issued with the object of transmitting to local authorities information collected by the Departmental Committee on Cancer of the Ministry of Health. Circular 1136, just published, differs from its predecessors in demanding instead of giving information. The Minister hopes that a more complete knowledge of the reactions between cancer and any local community may provide a basis upon which, after due consultation, to take local action. The tendency to delay seeking treatment until the opportunity of permanent relief has passed must be combated systematically. In the presence of cancer of those organs where an abnormality gives rise to some obvious sign or symptom the reasons for fatal delay, whether physiological, psychical, economic, or social, should be ascertained and met. In other organs, notably some of the internal organs, cancer does not at the onset give rise to signs which are easily recognisable, and here the chief prospect of good lies in securing improvement of the facilities for diagnosis. The treatment and nursing locally available for inoperable cases also requires consideration. As to the proposed methods of investigation, the local authority is asked to devise means for establishing contact with the patients. The Ministry anticipates that at first the field of inquiry will be limited to patients seeking treatment at hospitals administered by county and county borough councils and at voluntary hospitals, no difficulty being expected in securing friendly coöperation here. We do not ourselves see how it could be extended further without violating confidence. A questionaire in the appendix indicates the general lines on which inquiry might be made. Particulars about the patient himself, his history before and after coming under the observation of the local authority, and his subsequent history, whether or no radical treatment has been undertaken, should be ascertained. We welcome this official encouragement of geographical research, because it may give enlightening results. At the very least it should show where a further distribution of radium is required and where better provision is needed for the succour of inoperable cases.

ANNOTATIONS

HEART DISEASE AS A SURGICAL RISK.

THE association of heart disease with conditions requiring surgical interference calls for some of the most difficult decisions in medicine. On the basis of 414 cases an attempt has lately been made[1] to assess the risk in different types of cardiac disease. Major and minor operations of all types are included in the series, and the various forms of anæsthesia are not differentiated. The deaths are classified as "unexpected" and "inevitable," the latter including cases in which operation gave the only hope of recovery, although the patient was expected to die from causes other than heart disease. Consideration is chiefly given, of course, to the deaths from unexpected cardiac failure, probably caused by the operation. Among 120 patients who had valvular disease the unexpected mortality was only 2·1 per cent., while among 138 with chronic myocarditis, and 87 with permanent auricular fibrillation, it was only 4·9 and 3 per cent. respectively. An unexpected death occurred in a group of 17 cases of paroxysmal flutter or fibrillation, and one among 11 cases of syphilitic aortitis and incompetence. Twenty cases of coronary thrombosis provided eight unexpected deaths, but in five of them the diagnosis was overlooked before operation, and in seven the attacks followed operation. There were three deaths among 38 patients who had signs of failure before operation, and four among 12 patients who developed failure after operation. Out of 55 with a combination of nephritis and heart disease, eight died unexpectedly, which suggests that this combination adds greatly to the operative risk. A study of the incidence of raised blood pressure showed that it was the nephritis rather than the raised blood pressure which was dangerous, for patients who had a very high blood pressure were mostly good operative risks. An analysis of age incidence shows that the general opinion that the surgical risk becomes greater with advancing age is true for cardiac patients. The gist of the reviewers' conclusions is that in most forms of heart disease the surgical risk is not appreciably increased, but they emphasise the importance of accurate preoperative diagnosis and treatment.

CHARCOT'S ARTHROPATHY.

ELSEWHERE in this issue Dr. Harold Avery reports a case of Charcot's arthropathy affecting a site not hitherto described, the sacro-iliac joint. There is a widespread impression amongst clinicians that the Charcot joint is a somewhat mysterious entity which eludes explanation. It is true that in some ways —in the grotesque disorganisation of the affected joint, for instance—the condition is peculiar. Yet a recent paper by E. J. S. King[2] of Melbourne, suggests that these peculiar joint changes can easily be interpreted in terms of fundamental pathological principles. It is generally agreed that the primary ætiological factor is damage to the sensory nerves supplying the joint and, as the precise level at which the sensory pathway is interrupted is of no consequence, Charcot's disease is found in conditions as widely apart in nature and situation as peripheral neuritis and syringomyelia. Anæsthesia is not, however, the sole factor. Experiments on animals have shown that the anæsthetised joint remains healthy as long as it is protected from injury, but that subsequent trauma produces typical Charcot's disease. R. Leriche made some interesting observations on the fate of fragments of bone implanted into the joints in animals. Dead bone gave rise to no very striking reaction, whereas living implants provoked an extensive reaction in the surrounding tissues, characterised by marked polypoid thickening of the synovial fringes and extensive new formation of cartilaginous and bony tissue. A similar hyperplasia, almost sarcomatous at first sight, is commonly seen in the process of callus formation after fractures, the connective tissue cells having regained their embryonic power of forming cartilage and bone. King has found this same exuberant metaplasia around the joints in Charcot's disease, and in one case an isolated fragment of necrotic bone occupied the distorted joint cavity. From these considerations he is led to suggest that Charcot's disease is merely an exaggerated form of osteo-arthritis in which the stimulus to the inflammatory reaction is supplied by the products of dissolution of small fragments of necrotic bone. The reaction of the tissues is exaggerated simply because the anæsthetic condition of the joint permits frequently recurring trauma, of which the patient is unaware.

[1] Butler, S., Feeney, N., and Levine, S. A.: Jour. Amer. Med. Assoc., July 12th, p. 85.

[2] Brit. Jour. Surg., 1930, xviii., 113.

A MEDICAL FILM LIBRARY.

Messrs. Kodak have now in London the nucleus of a valuable library of medical films. The potential importance of cinematography in medical education was early appreciated, and a surgical operation was filmed at the West London Hospital as long as 25 years ago. With improvements in apparatus and technique it has now become possible to record a wide variety of subjects. The Kodak library at present contains about 60 films made in this country and abroad. They are classified under various headings—e.g., anatomical, neurological, obstetrical, surgical, physiological, dental, and veterinary—and they will be found increasingly useful by demonstrators and teachers. Some are intended to show to students the detail of accepted technique; others enable practitioners to study the methods of distant clinics. As an example of the first group we may mention a film on blood transfusion which shows the surgical procedure in such detail that several experienced donors collapsed on seeing it. A border-line example is a record of prostatectomy by Sir John Thomson-Walker, which is an undoubted triumph but would probably be of greater use to the well-informed than to the ignorant. For the surgical student the advantage of the cinema is that it is capable of showing every step of a complex operation; he is presented with a full account of the battle rather than occasional glimpses of a stricken field. Since there is no advantage in photographing an actual operation—and many disadvantages—we believe that in this branch the best results will often be got by taking films from models rather than the living subject. As the value of instructional films is appreciated it will become worth while to spend time and money on making explanatory records for students, and to many minds they will

be far more useful than text-book descriptions. The Kodak library already contains diagrammatic films, and they will convince the sceptical. Impressive, but possibly less successful from the learner's standpoint, are the films where natural processes are accelerated. The development of a rabbit ovum at 360 times the normal speed has an air of liveliness which seems scarcely proper even in a rodent.

We hope that medical societies and similar bodies will make abundant use of the library, and notably of the films demonstrating foreign methods—e.g., the management of normal birth in the gynæcological clinic of Berlin University. Special attention may perhaps be drawn to a 52-minute reel which shows the diagnosis and treatment of infections of the hand and has been made under the authoritative direction of Dr. A. B. Kanavel, of Harvard While it appears that Messrs. Kodak are helping to make travel unnecessary, the inclusion of such films will do much to disprove the sublime saying that "to travel is to discover that everybody is wrong."

The catalogue is obtainable from Kodak House, Kingsway, W.C.2.

THE PATHOGENESIS OF ECZEMA.

SINCE the early days of scientific dermatology, research has eliminated from the conditions, formerly grouped loosely together as "eczematous," a host of disorders of the skin, by discovering their true ætiology, and placing their pathogenesis and treatment on a secure foundation. In this category are to be found the skin ailments due to fungi and yeast, seborrhœic dermatitis, trade "eczemas," and those which exhibit a special idiosyncrasy to such a variety of noxæ as primula, turpentine, cat fur, and so forth. After eliminating them we are left with a group in which no demonstrable cause or "antigen" is found to account for the peculiar inflammatory symptoms for which the name of eczema must still serve. Examples of typical reactions were given by Prof. W. Scholtz in a paper communicated to the German Dermatological Congress at Königsberg.[1] For instance, a little iodoform gauze applied to a wounded finger produces on the following day a crop of vesicles at the site of application. The patient has developed iodoform dermatitis, which subsides on withdrawal of the dressing but will recur in loco whenever iodoform is reapplied. The patient is said to have an idiosyncrasy to iodoform, but is not affected by any other irritant such as mustard oil, croton oil, or capsicum. He remains well unless he comes in contact with iodoform. Another patient reacts to iodoform in the same way, but the dermatitis spreads in spite of withdrawal and careful removal of all traces of the iodoform from the area of local contact to the hand, forearm, and other places, and after subsiding may, perhaps, light up again and again either locally or in distant areas. On inquiry one may perhaps elicit the fact that the patient has had previous attacks of a weeping skin eruption, and is sensitive to a number of skin irritants. The diagnosis in this case is iodoform dermatitis in an "eczematous" subject, and the outlook in the two cases is entirely different. In the first we are entitled to assume that the patient will remain well so long as he avoids iodoform, while in the other we can never be sure how long he will remain free from the tiresome symptoms of his eczematous diathesis. The facts are still further complicated by the existence of a third type of reaction. This concerns the individual —usually a workman—whose reactions are strictly localised to the hands, which in the course of years of exposure and traumatism of all kinds eventually become sensitive and react with the production of eczema to even the mildest irritants; or the trouble may arise when the hands are used in any light employment, but remain well if protected in gloves or kept greased with salve. Similar examples of local susceptibility are met with on the face, the scrotum, or on the shins, and in such cases we have to deal not with a sensitiveness to any particular irritant (allergy), but to a presumed anatomical or biochemical alteration of the epidermis of the affected area. In thus subdividing the manifest examples of a complex disease we must not lose sight of the fact that there are individuals who cannot be accurately grouped in any one of the three specified classes. There must always be intermediate and "passage" cases in any system of artificial classification.

The whole question of eczema and its causation is of the greatest interest. Among those who are engaged on its investigation the name of Dr. Bruno Bloch, of Zurich, stands prominent at the present time. He has succeeded in reproducing the complete clinical and histological picture of eczema in guinea-pigs, by introducing by injection (or local application) the ethereal extract of the irritant substance of *Primula obconica*. This is actually the first occasion in which a permanent allergic cutaneous reaction of the skin had been successfully conveyed to animals, and the accomplishment is likely to lead to a material progress in the therapeutics of eczema. The details of his work, which have already become widely known, will form the substance of a paper to be read at the forthcoming International Congress of Dermatology to be held at Copenhagen. Prof. Darier, of Paris, will be the principal speaker, and his address will be followed by that of Prof. Jadassohn, of Breslau, while those taking part include such well-known names as Bloch, Oppenheim, Sabouraud, and Whitfield. After many years in which progress has been slow, it seems that at last this most important problem in dermatology is on the way to solution.

[1] Scholtz, Prof. W.: Dermat. Woch., 1929, lxxxix., 1143.

HISTORICAL ADDITIONS TO THE HUNTERIAN MUSEUM.

THE historical series of the Museum of the Royal College of Surgeons of England has been enriched by several gifts. Among these is a mahogany medicine chest that formerly belonged to Dr. Edward Jenner, the discoverer of vaccination, with most of its fittings intact. This beautifully made little cabinet is of the type commonly found in doctors' surgeries about the end of the eighteenth century. The upper part, which has a hinged lid, is fitted with four wide-mouthed bottles with metal caps for holding powders, and in a separate compartment is a pewter medicine measure, a small pewter funnel, and two palette knives with silver handles. Here, also, is a receptacle for the scales and a box with a sliding cover for the weights. In the front compartment, which opens with a door, are five stoppered bottles of four-ounce capacity, and below are seven drawers with ivory knobs. Five of these are divided into four compartments with sliding lids for containing powders, one of which still contains some compound senna powder, a remedy much in vogue in Jenner's time. The two drawers below are each fitted with four glass jars for ointments, and contain the remains of yellow basilicon, zinc and spermaceti ointments. Another compartment, which occupies the back of the cabinet, contains

eight stoppered bottles for liquids, each of eight-ounce capacity. This relic is fully authenticated.

Another interesting gift is a fine compound microscope that belonged to Sir William Bowman, the first President of the Ophthalmological Society of Great Britain, presented by his grandson. It was used by him in making his classical discoveries. It is one of the early massive achromatic instruments of the last century, and was made by Hugh Powell in 1840. A case of ophthalmic instruments used by Sir William has also been presented. An extraordinary ju-ju or fetish that was taken from a notorious witch-doctor at Ohitsba, in Nigeria, which mainly consists of human skulls and bones, has been added to the collection. It is made up of a "mass" of vegetable matter (the witch-doctor's medicine), bound together with fibre and surrounded by a circle of eight human skulls, one of which has an indentation probably caused by a blow. Dr. Aly Bey Ibrahim, of Cairo, has given two old native Egyptian trusses, made and used in that country about the seventeenth century. These primitive appliances are made of hoop-iron, crudely covered and padded with black and white cotton. A palm-leaf manuscript from Ceylon, enclosed in wooden covers, decorated in red and white, is the gift of Dr. Casey Wood. The leaves are inscribed with medical recipes, and notes given by a senior native physician to his pupils, and recorded by the student from time to time.

The collection of amputation saws has been augmented by a specially arranged series showing the development of the instrument from the flint saw used by the ancient Egyptians about 4000 years ago. It includes examples of the early bow-saw employed in the thirteenth century, saws used in the time of Ambroise Paré, and specimens of the tenon-saw of the eighteenth century used by Percival Pott, and also shows the improvements made in the instrument down to the close of the nineteenth century.

THE MENTAL RADIO.[1]

Mr. Upton Sinclair's books have acquired and deserved a large circulation, but he breaks entirely new ground in writing of telepathy. His wife, however, having discovered in girlhood that she possessed some power of mind-reading, the opportunities for an intimate study of telepathy thus offered to Mr. Sinclair have produced in him a complete conviction the spirit of which will be found throughout the book as shown in these words. "For the past three years," he says, "I have been watching this work, day by day and night by night in our home. So at last I can say that I am no longer guessing. Now I really know. I am going to tell you about it, and hope to convince you; but regardless of what anybody can say, there will never again be a doubt about it in my mind. *I know.*" Prof. William McDougall, who provides an introduction to the book, is sympathetic, for he writes: "Mrs. Sinclair would seem to be one of the rare persons who have telepathic power in a marked degree and perhaps other supernormal powers. The experiments in telepathy, as reported in the pages of this book, were so remarkably successful as to rank among the very best hitherto reported. The degree of success and conditions of experiment were such that we can reject them as conclusive evidence of some mode of communication not at present explicable in accepted scientific terms, only by assuming that Mr. and Mrs. Sinclair either are grossly stupid, incompetent, and careless persons, or have deliberately entered upon a conspiracy to deceive the public in a most heartless and reprehensible fashion."

The very first illustration of what Mr. Sinclair calls "a mental radio" does appear to close the usual avenues of doubt. A man "agreed to make a drawing of any object he might select at random and then to sit gazing at it concentrating his entire attention upon it for a period of from 15 to 20 minutes." The obvious ambiguity in the quoted sentence has, it seems, no bearing on what happened. "At the same agreed hour . . . . Mrs. Sinclair was lying . . . . forty miles away . . . . in semi-darkness with her eyes closed, employing a system of mental concentration." As a result she took pencil and paper and wrote, with the date, in six words exactly what the drawing would be found to be. And so it was. The book continues to set out in illustration, successes, partial successes, and failures in a series which are summarised by the author thus: "I have now given nearly all of the 65 drawings which I call 'successes' and about half of the 155 which I call 'partial successes.' This, I think, is enough for any purpose. No one can seriously claim that such a set of coincidences could happen by chance, and so it becomes necessary to investigate other possible explanations." Prof. McDougall's verdict is that Mr. Sinclair's book will amply justify itself if it leads readers to undertake carefully and critically experiments similar to those described.

[1] Mental Radio: Does it Work and How? By Upton Sinclair. London: T. Werner Laurie. 1930. Pp. 211. 8*s.* 6*d.*

THE BLOOD-SUPPLY OF THE LIVER.

It would be generally thought that the blood-supply of the liver is pretty well understood, and in a rough way this is no doubt true. But we gather from a paper by Dr. G. R. Cameron and Dr. B. T. Mayes,[1] on the results of tying the hepatic artery, that there is still a good deal to find out and say on the subject. What, for example, is the precise relationship between the portal vein and the hepatic artery? The portal vein can be injected quite easily from the hepatic artery and a radiogram of a liver treated in this way with lipiodal is very similar to one of a liver into which the injection has been put via the portal vein. No arterio-venous anastomoses between the two sets of vessels could be found within the liver. It appears that the hepatic artery after entering the hilum breaks up into capillaries which supply mostly the walls of the portal vein and the bile-ducts. These reunite into venules which join the venules of the portal vein either in the portal canals or at the periphery of the liver lobules, and it is this conjoint stream which passes into the sinusoids and supplies the parenchyma. There seems to be no justification for the idea originating and being mostly propagated in pathological circles, that the hepatic artery specially supplies the outer zone of the liver lobule; all parts of the lobule receive the same blood, which varies only in so far as it becomes deoxygenated on its passage towards the intralobular radicle of the hepatic vein. Cameron and Mayes suggest that the hepatic artery does not differ in its general plan from the mesenteric arteries.

It is also clear from the observations and experiments now recorded that the liver receives more than negligible quantities of blood from sources other than the hepatic artery and portal vein. Deprivation of any part of the liver of portal blood leads to a slow disuse-atrophy of the corresponding liver cells; deprivation of arterial blood results in

[1] Jour. Path. and Bact., 1930, xxxiii., 799.

acute necrosis and degeneration. Though ligature of the whole of the hepatic artery leads to necrosis of so much liver that the animal usually dies, yet the necrosis by no means involves the whole liver. The experiments on tying the various branches of the hepatic artery must be considered in relation to the anatomy of the rabbit, which was the animal they used, but it is surprising how much of the artery, especially in young animals, may be made functionless without causing any necrosis at all. Cameron and Mayes found too that, if the whole of the hepatic artery, portal vein, bile-duct, and inferior vena cava above and below the diaphragm were tied, methylene-blue injected into the jugular vein could be seen to enter the liver almost at once. There are no named arteries which could account for this, but it is evident that there is an abundant collateral supply through the diagphragm and from the abdominal connective tissue which is of considerable importance in maintaining the vitality of the liver cells. In a full and scholarly discussion of the literature the authors point out that the results of accidental ligature of the hepatic artery and parts of it in man vary from death to no symptoms, and their results explain the apparent immunity in which some surgeons have been able to rejoice.

PUBLIC HEALTH SERVICES AND THE MINISTRY OF HEALTH.

SOME changes are notified in a circular (No. 1129) addressed to local authorities by the Ministry of Health in the annual returns required by the Minister in connexion with the maternity and child welfare, tuberculosis, and venereal diseases services.

The following returns will be dispensed with: (1) annual returns giving detailed statistics of the work of homes and hospitals for mothers and for children; (2) annual returns giving summary information as to the work performed at treatment centres for venereal diseases, and as to the treatment of these diseases in poor-law institutions and in hostels; (3) monthly returns giving the numbers of patients in residential institutions approved for the treatment of tuberculosis, and the numbers of empty beds, on the first day of each month. On the other hand, returns not previously supplied and now required include :—

Maternity and Child Welfare.—Annual returns relating to any maternity home or hospital provided or subsidised by the local authority, and to the maternity wards in institutions newly transferred to them. Moreover, since the previous Exchequer grants to voluntary associations have been replaced by annual contributions from the appropriate local authorities, the returns furnished by local authorities must include the maternity and child welfare work of these associations.

Venereal Diseases.—An annual return (*a*) from medical officers of treatment centres, and (*b*) from pathological laboratories which are approved under the Public Health (Venereal Diseases) Regulations, 1916.

Tuberculosis.—Annual returns of notifications, and of cases remaining on the registers of notifications at the end of each year.

The Minister has also decided to require an annual return showing (*a*) the amount and nature of the accommodation available for the treatment of the sick in institutions transferred to the councils and in general hospitals provided under the Public Health Acts or the Local Government Acts; and (*b*) the use made of the accommodation during the year.

ALLVAR GULLSTRAND.

THE death is announced of Prof. Allvar Gullstrand at the age of 68. He was appointed professor of ophthalmology in the University of Stockholm in 1894, and subsequently professor of physiological and physical optics. In 1911 he received the Nobel Prize for his researches in the dioptrics of the eye, and in the same year he demonstrated the first model of the slit-lamp with which his name will always be associated. This is the instrument by means of which, in conjunction with the corneal microscope, it is possible to examine an anteroposterior section of the anterior part of the living eye, and its use has given us much new knowledge of the structure of the cornea and of the crystalline lens, both in normal and in diseased conditions. Prof. Gullstrand was an honorary member of the Ophthalmological Society of the United Kingdom.

Sir Charles Sherrington, O.M., Waynflete Professor of Physiology in the University of Oxford, and Dr. J. A. Arkwright, F.R.S., honorary bacteriologist to the Lister Institute of Preventive Medicine, have been appointed members of the Medical Research Council in succession to Sir Frederick Hopkins and Sir Charles Martin, who retire on Sept. 30th.

INDEX TO "THE LANCET," VOL. I., 1930.

THE Index and Title-page to Vol. I., 1930, which was completed with the issue of June 28th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee 34 grants were made amounting to £515. The following are particulars of some of them :—

M.R.C.S., aged 80, with wife aged 70. Has been in practice for over 50 years, but latterly, owing to increasing deafness, there was a falling off of patients and corresponding loss of income. The daughter, aged 40, looks after her aged parents. The three live on a total income of £184 a year. £150 of this is contributed by a son, aged 39, who is a bank cashier at a salary of £425, and has to keep himself in lodgings. Voted £40.

Widow, aged 51, of L.S.A. who died in July, 1930, aged 71, and who was helped by the fund during the last two years of his life. He was also in receipt of an allowance of £104 a year from another charity, as he was unfit for work and in receipt of the old age pension. The widow has been left with nothing. The allowance of £104 has been discontinued as the widow is not eligible for this help, and the old age pension has been stopped. The widow has obtained a post as companion to an old lady at a salary of £1 a week, without food. Owing to a recent accident and a broken wrist active employment with larger salary is difficult to find. Voted £26.

Widow, aged 63, of M.D. Husband died in 1929, leaving his widow destitute, her only support being her daughter, who is earning 48*s.* a week. Voted £26. Epsom College has also given a pension.

Widow, aged 55, of M.B. Husband suffered from tuberculosis since 1897, and died in 1919. His money was mostly invested in Germany and has been lost. The widow supported herself by taking in paying guests, but owing to diabetes has been unable to do much work. She has been further handicapped by her son, aged 30, who has congenital heart trouble. The presence of the son in the house has frightened away guests who otherwise would have stopped. Voted £26.

Subscriptions and donations are urgently needed in order that the activities of the fund may be continued and applicants given the help they need. Cheques should be forwarded to the honorary treasurer of the Fund at 11, Chandos-street, W. 1.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCIV.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

PART II.*

Phrenic Evulsion.

EITHER dome of the diaphragm receives its nerve-supply through the phrenic nerve. Destruction of this nerve-supply causes paralysis of the dome and atrophy of the muscle-fibres. As a result of this the dome rises up into the thorax, partially on account of the intrathoracic negative pressure, but mainly because of the intra-abdominal pressure. The maximum rise is not seen until complete atrophy of the muscle has occurred. During respiration paradoxical movements may be seen, the paralysed dome rising with inspiration and falling with expiration. The extent of the rise varies greatly in different individuals, depending on the extensiveness and character of the basal adhesions. It may be as little as 1 or 2 cm. or as much as 7 to 8 cm. The effect of these changes in the dome of the diaphragm is to diminish the size of that half of the chest and so to allow of a measure of collapse of the lung; also to relax all tension from the structures in immediate direct or indirect contact with the upper surface of the dome. The reduction in the size of the hemithorax results in a partial collapse of the lung. In some cases this collapse is mainly confined to the base, but in others it affects the whole lung to such an extent even that cavities in the apex become considerably reduced in size. The abolition of the tonic contraction of the muscle and the relaxation of the strain on adjacent structures abolishes such symptoms as the constant, reiterated, purposeless cough so characteristic of diaphragmatic irritation; it removes the dragging ache and pain associated with basal adhesions; it restores in part the heart and mediastinum displaced by chronic fibroid contraction, and diminishes the tachycardia and dyspnœa which may be an accompaniment of this change.

The realisation of these changes enables one to appreciate how great is the field of usefulness of hemidiaphragmatic paralysis. There is, however, a limitation of this field due to the uncertainty of the amount of rise of the dome. Fortunately the operation is of such comparative simplicity that the risk of this uncertainty is worth taking.

The indications for hemidiaphragmatic paralysis by phrenic evulsion, briefly stated, are :—

(1) For cases of basal tuberculosis. It may also be helpful in basal bronchiectasis, but more often than not the results are disappointing.

(2) For cases of more extended tuberculosis which require additional treatment to arrest the disease. As already pointed out, even cavities in the upper lobe may have their walls approximated as a result of the rise of the dome following evulsion of the phrenic.

(3) As an accessory to artificial pneumothorax : (*a*) when the base is held out by adhesions; (*b*) to lengthen the interval between refills; (*c*) it is said to check the occurrence or recurrence of pleural adhesions; (*d*) to reduce the size of the hemithorax when the collapse is being given up and the lung being allowed to re-expand.

(4) For the treatment of symptoms such as cough, tachycardia, and dyspnœa.

(5) As a preliminary to thoracoplasty.

* Part I. appeared last week.

The original operation of simple section of the phrenic nerve was often a failure. The reason of this is that the nerve originating from the fourth cervical and possibly from the third and fifth cervical roots also, and crossing the scalenus anticus muscle, is not always the sole source of supply. There is frequently an accessory phrenic nerve arising from the brachial plexus, sometimes from the nerve to the subclavius muscle, and not infrequently jointly with the suprascapular nerves. This accessory nerve passes downwards and joins the true phrenic in some part of its intrathoracic course, usually about the level of the first rib.

The destruction of this possible dual source of supply is accomplished by evulsion of the phrenic nerve. The operation is a comparatively simple one, done under local analgesia. The phrenic nerve is reached in the neck through an incision 2 to 2·5 cm. long, made at the outer border of the sternomastoid muscle at about the level of the cricoid cartilage. The phrenic nerve is exposed as it crosses the scalenus anticus muscle; it is divided, and then the distal end is drawn out of the wound. In a successful case of evulsion the whole nerve, including the terminal filaments detached from the diaphragm, will be withdrawn. Often the nerve breaks; but if some 10 to 12 cm. of nerve have been evulsed, hemidiaphragmatic paralysis will have been achieved.

EXTRAPLEURAL PNEUMOLYSIS.

Extrapleural pneumolysis is an operation most often done over the apex of the lung, and is then called apicolysis. A localised collapse of the lung, together with the parietal pleura, is produced by stripping this membrane away from the deep surface of the chest wall. The lung in part retracts and in part is displaced by the operator, and a space is left between the outer surface of the parietal pleura and the chest wall. As the air in the space would soon be absorbed with consequent re-expansion of the lung, it is necessary to fill the cavity with some substance which will maintain the lung collapse. Paraffin, with a melting-point of 110° or 112° F., is one of the substances so used. It has, however, the disadvantage that it may irritate the pleura and cause an extrapleural effusion, the fluid from which opens up a track through the wound and, escaping, carries with it the paraffin. Transplanted fat may be efficacious; on the other hand, it may liquefy and, working its way to the surface, eventually discharge through the skin. Some surgeons use a packing of gauze or of rubber strips which are later removed. The cavity is then allowed to become obliterated by granulation tissue. My own preference is for a living, pedunculated graft, using the pectoral muscles in men and the breast in women.

The indications for the operation are localised lesions with or without cavities, especially those situate in the apex of the lung. It is also used after thoracoplasty to supplement the collapse obtained by this operation when there is a thick-walled cavity which has resisted collapse. The operation is not one particularly gratifying in its results, for which reason it is not often done. There are, however, certain cases for which a localised apical collapse is particularly indicated. For such cases I have recently been trying a localised modification of the extrapleural thoracoplasty. The rib resection in these cases is localised to the first four or five ribs up to the transverse

rocesses, but the total length of bone resected is onsiderably more than would be done if one was iming at collapse of the whole chest wall. For instance he length of bone removed from the first rib is from ·5 to 4 cm., and of the fourth rib 12·5 cm. or more. his operation of localised thoracoplasty causes no ore shock and does not take as long as apicolysis. he risks of tearing the lung are less, as also are the isks of post-operative complications. So far as my xperience goes the results are most gratifying and ore constant.

Thoracoplasty.

The object of the operation of extrapleural para-ertebral thoracoplasty is to obtain collapse of the ung by mobilising the ribs so that they fall in towards he spine and mediastinum, and so greatly diminish he corresponding side of the chest. This is achieved y resecting lengths varying from 2·5 cm. to 12 or 5 cm. from the posterior ends of the ribs right up o the transverse processes. The operation is usually lone under a combination of local and regional næsthesia and of a general anæsthetic. When the lisease is extensive the resection must be of the first 0 or 11 ribs, and is then done in one or two stages ccording to the general condition of the patient, the tate of cardiac sufficiency, and the amount of putum. For disease confined to the upper part of he lung, resection of the first seven or eight ribs in ne stage will suffice. Always, however, the first rib ust be included, since each rib is slung on to the one bove, and so on up to the first.

This operation is indicated in those cases which are ot responding to sanatorium treatment, or in which æmorrhage is a serious or recurring symptom and n which an artificial pneumothorax has failed. In ng-standing cases of intense fibrosis with multiple avitation and sacculation of the bronchi, thoraco-lasty is preferable to artificial pneumothorax. The ontra-indications are much stricter than for pneumo-horax. It is essential that there is no activity of the lisease in the opposite lung. Sometimes it is very lifficult to distinguish between persistent catarrhal moist sounds at the apex of a lung and the crepitations of activity. Observation of these sounds over a long period alone can help to differentiate between them. The mortality as a result of the operation is about 5 per cent. The results of successful intervention are, nowever, most gratifying as the collapse is permanent nd not a continually varying one, as in artificial neumothorax. The late results collected by J. Alexander show that 36·8 per cent. are healed and 24·4 per cent. benefit by the operation. Despite the collapse of the chest wall, the resulting deformity is extremely small and not noticeable when the patient s clothed. There should be no interference with the ree movement of the arm. The patient, moreover, s even less handicapped than with an artificial neumothorax, as there is no question of recurring ttendance for treatment by refills nor the risk of leural complications.

Multiple Neurectomy.

The excision of parts of each of the intercostal nerves leads to a paralysis of the intercostal muscles. The effect of this, especially when combined with phrenic evulsion, is to immobilise the corresponding side of the chest wall and to cause slight falling in of the chest wall. The operation has been suggested by Alexander for cases needing a thoracoplastic operation, but in whom there is contra-indication owing to the extensiveness of the disease or the frailty of the patient.

Conclusion.

These operative procedures and the results obtained by them show that surgery has immense value in the treatment of pulmonary tuberculosis. They show also how indispensable surgery has become in supplementing sanatorium treatment, and how essential it is, therefore, that surgical facilities should be regarded as a necessary part of the equipment of every sanatorium.

H. Morriston Davies, M.D., M.Chir. Camb., F.R.C.S. Eng.,
Medical Superintendent, Vale of Clwyd Sanatorium; Consulting Surgeon, University College Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdrs. A. W. Cocking and W. E. Heath to be Surg. Comdrs.

Surg. Comdr. G. E. D. Ellis is appointed to the battleship *Iron Duke*, and Surg. Comdr. R. N. W. W. Biddulph to the *Victory* for duty in Portland Dockyard.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. (D) G. K. MacLellan to be Surg. Lt.-Comdr. (D).

Surg. Sub.-Lts. A. Elliott, W. J. Poole, and V. S. Hughes-Davies to be Surg.-Lts.

Prob. Surg. C. Mason to be Surg. Lt.

The following appointments are notified: Prob. Surg. Lt. W. H. Roberts to *Marlborough*, for training; Prob. Surg. Sub-Lt. P. B. Moroney to *Norfolk*, for training.

ROYAL ARMY MEDICAL CORPS.

Lt. F. M. Collins to be Capt.

ROYAL AIR FORCE.

Flight-Lt. H. O. Sumerling is promoted to the rank of Squadron Leader (Dental) on promotion to Major in the Army Dental Corps.

INDIAN MEDICAL SERVICE.

Col. C. A. Sprawson to be Maj.-Gen.

Lt.-Col. J. C. S. Oxley retires.

The probationary appts. of the under-mentioned officers are confirmed: To be Lts.: K. F. Alford (now prov. Capt.), H. S. Waters, J. H. Boultbee, H. T. McWilliams, P. Shannon, H. J. Curran, E. A. Y. Mackeown, W. P. Lappin, B. J. Griffiths, G. Milne, A. M. Fraser, D. L. Trant, A. M. Sheridan, and P. J. Walshe.

Dewan Pitamber Nath to be Lt. (T.C.).

Rheumatic Clinic for Brighton.—The Health Committee of Brighton Corporation has approved a scheme for building a new rheumatic clinic at a cost of £75,000. The local branch of the British Medical Association has given its support and, on the recommendation of Dr. Duncan Forbes, the medical officer of health, the Silwood Hall Hotel is to be bought for the purpose for £25,000; the cost of remodelling the building will be a further £35,000. It is estimated that the clinic will allow of 85,000 treatments a year, and that the income would be about £17,000.

Coördination of Liverpool Municipal Hospitals.—Reporting to the Liverpool public assistance committee, the medical officer of health, Dr. A. A. Mussen, propose that the whole of the municipal hospital service should be brought under the management of the port sanitary hospitals committee, and advises the erection of a new hospital in the outskirts, on a site sufficiently large to provide for extensions. In the ten poor-law institutions now managed by the public assistance committee there are 9813 beds, as compared with 1635 beds in the eight hospitals, and about 300 children's cots, administered by the port sanitary hospitals committee. By a large majority the public assistance committee has approved the principle of the report which is to be sent to the Liverpool voluntary hospitals representative committee for consideration.

SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN LONDON.

PROCEEDINGS OF THE REPRESENTATIVE BODY.

(*Concluded from p. 209.*)

Dr. H. B. BRACKENBURY put four points before the meeting, having reference to conditions under the new Local Government Act.

Effects of Local Government Act.

First, he asked, what could the local authorities do to further the Association's policy of unification of health services? On April 1st the vaccination and infant life protection services had been handed over by the poor-law authorities to the care of the public health authorities. Certain services had received permission from the new authorities for administration under other Acts than the poor-law; for example, some pauper children would be dealt with under the Education Act, and others, who were blind, under the Blind Persons Act. The new authorities were also at liberty to appropriate poor-law institutions for public health purposes. In addition, every local authority had appointed a public assistance committee, and could delegate to this committee its poor-law functions, both advisory and executive. The public health committee might in turn delegate part of its work to other committees; pauper mentally deficient children, for example, could be handed over to the committee for mental deficients. Dr. Brackenbury next spoke of the position of district medical officers. It was proposed that the Association should ask that whole-time officers, apart from exceptional circumstances, should not be engaged in domiciliary attendance on the indigent poor. These patients, it was felt, should come under the care of general practitioners, or part-time officers, for two reasons: in order that the patient might have the advantage of a free choice of practitioner, and so that no one need be under the stigma of "having to have the poor-law doctor."

The third subject raised was representation on local authorities. The law prohibited any person in the employment of a local authority from being a member of that authority. The result of this was that it was gradually becoming more and more difficult for any member of the medical profession to be engaged in public work, and this was not an advantage from the point of view of the community. Some arrangement should be sought with the Ministry of Health to effect a change in the law.

The speaker's fourth point concerned the superannuation of those poor-law medical officers who left their posts on April 1st. Up till that time many of them had been members of their local authorities, but under the new Act they were forced to resign either their membership or their office. Those who had chosen to continue their public work, and to leave their medical post, lost all their savings under the superannuation scheme to which they had been contributing compulsorily for years. Yet, had they been dismissed for misconduct, their money would have been refunded to them. The numbers who had suffered in this way were few, but the injustice was a striking one. The Association had succeeded in placing a one-clause Bill before Parliament, but it had not been pushed. It was desirable that public opinion should be brought to bear to get the Bill passed.

Dr. H. KERR expressed the thanks of whole-time medical officers to the Association for opposing the first draft of the poor-law order. Under this draft the medical profession had been subordinate to the public assistance officer. The recall of this clause, and substitution of less objectionable terms had been due to the Association.

Medical Patents.

In the absence of Dr. ARNOLD LYNDON, Dr R. LANGDON-DOWN introduced the subject of patents, his motion being that it was ethically undesirable for a registered medical practitioner to derive financial benefit from the sale of the rights or from royalties for any invention or discovery in the medical field which he might make. The Council had been approached by two outside bodies for a ruling on this point. One of these, an industrial body, the Association of British Chemical Manufacturers, was anxious to know whether the attitude of the medical profession had changed; it had always been taken for granted that medical practitioners were opposed to any monopoly implied in patenting. In 1927 an opportunity had occurred for testing this attitude when insulin was patented and handed over to the control of the Medical Research Council. The profession had always used strong expressions against private patenting in the past, and would doubtless still object to monopoly, secrecy, and hindrance to research. On the other hand, practitioners would be equally anxious to be free of any charge of hindrance to industry or commercial research. It would probably be possible to dedicate a patent compulsorily to a public patents trustee. Practitioners might consider that the time had come to sweep away all restrictions on private patenting, but if it was felt to be undesirable to abolish this 300 year-old principle an amendment on the lines indicated might be considered. This was a matter for the profession as a whole; the General Medical Council was concerned with medical education, the maintenance of the Register, and the indication of the low line of medical conduct.

Patenting tended to produce secrecy in the worker, it did not encourage the early publication of results and it fostered haste and rivalry of an undesirable kind, rather than the scientific detachment required for research. Moreover, it gave the great reward to the man who laid the last brick on an edifice which might be the work of many. Though intended to safeguard the public from the dangers of monopoly the approach for the removal of an abused patent could not be made for three years. It was unlikely that anyone would wish to patent a discovery of a clinical nature, but a person working in the chemical or biological world could scarcely occupy the clinical field as well, and his discoveries would verge on the commercial. There was now an opportunity for relaxation and adjustment so as to give some freedom of patenting and to safeguard against undue monopoly.

Dr. E. GRAHAM LITTLE proposed that the motion should be referred back to the Council for further consideration. The Council appeared to agree that some form of patenting must be considered, and to be inquiring, merely, into the best way to do it. The

Association could not direct the attitude of the profession, but could only lay down rules for members. In answer to a private inquirer, the President of the General Medical Council had expressed the view that a discovery or invention should be made available for the public good, and that the name of the discoverer or inventor should not be associated with it in order to acquire patients. But it seemed unfortunate to make a separation between the medical profession and other men, and to rob the doctor of a right which any other member of the community was in a position to demand.

Mr. H. S. SOUTTAR seconded the proposal to refer the matter back to the Council. A new situation had arisen, he said, requiring consideration. There was no question but that patents must be taken out; the question was who should take them out. At present patents could be taken out in Germany for chemical preparations invented in England, with the result that English manufacturers could not use them. The chief value of patents would be to protect this country against a foreign monopoly. A patent did not mean secrecy; indeed the condition on which it was granted was that the inventor should publish the method of production in detail. It was, in fact, a guarantee against monopoly, secrecy, and hindrance, to research. He had himself never taken out patents for the plain reason that there was nothing to be gained by it as far as he was concerned. But he had consulted two medical men of first-class ability, researchers on certain organic chemical compounds. One had produced hundreds of preparations for the treatment of a tropical disease; but without the opportunity to patent them he gained no financial recompense for his labours. In these circumstances it was impossible to find a manufacturer to take up the production of preparations which might become the monopoly of foreign firms. This type of work deserved recompense—it required a very high standard of ability. He dissociated himself from the idea that these men should not engage in clinical work for contact between clinical and laboratory work should be encouraged, nor should the profession disparage the man who tried to make a living from laboratory work. Dedicated patents had been suggested to solve this problem; these were excellent from the point of view of the manufacturer, but less satisfactory to the medical man, who would receive back what the public trustee thought fit—a doubtful privilege. As an example of the possible results he cited the case of the inventor of the trench mortar during the late war, who spent £14,000 on its production; this sum he recovered from the nation after much litigation, but 18 per cent. of it was immediately reclaimed in income-tax. He ended with a loss of several thousands of pounds. The point was of great importance to the individual medical man, and should be referred back to the Council.

Dr. F. TEMPLE GREY suggested that as there had been an unwritten law on this point for 300 years it might as well remain unwritten. Why should not the matter of patents be left to each man's judgment and taste? Many of the points put forward against patents were covered by Act of Parliament; it was required that preparations should be put on the market at the lowest possible price, and that the inventor should receive due reward. There was nothing disgraceful in a patent, and no one ought to be removed from the Register for taking one out. The term had been confused by the issue of so-called "patent medicines," which, in fact, were never patented, and of which the composition was kept a secret. The proposal to refer the matter back to Council received further support from Dr. NOEL WATERFIELD, and this course was approved by the meeting. A further motion to refer back to the Council a section on dedicated patents was also carried.

Fees for Midwifery.

Dr. J. W. BONE introduced the Council's proposals for changes in the existing scale of fees paid by local supervising authorities in cases where medical practitioners are called in on the advice of midwives. The present scale, he said, came into force on Jan. 1st, 1923; all the fees were inadequate, but in the past he had been unable to persuade the Representative Body to do more than say so. The departmental committee had now thought it time to revise the fees, and the Council had asked for certain alterations. These were: that the fee of the doctor for attending parturition should be raised from £2 2*s.* to £3 3*s.*; that the fee for attendance of mother and child at the doctor's surgery should be raised from 2*s.* 6*d.* to 3*s.* 6*d.*; that there should be no payment of a fee for services performed by the doctor after the tenth day from his first visit unless he had reported to the local authority that he considered, for reasons stated, that further attendance was necessary, or unless he was called in by the midwife under her statutory rule; and, finally, that the provisions for payment of a fee for visits to the mother other than attendance at labour or miscarriage, for mileage, and for attendance of the mother at the surgery, should also cover ante-natal examinations. The Council had asked for as much as was deemed advisable, and it would be unwise to go beyond a scale which the Association might reasonably expect to obtain.

In the discussion which followed the inadequacy of the old, and even of the revised scale, was stressed.

Dr. H. W. POOLER, speaking of post-partum hæmorrhage, said that no doubt the local authorities could find practitioners to attend cases for a guinea, but that no doctor went to such a case because of the fee. The reasons for his attendance could not be assessed in money. A differentiation between the fee for adherent and the fee for retained placenta had been discussed in his division, but it was felt that it was not easy to draw a dividing line which would satisfy public opinion.—Dr. BONE, in answering the second point, said if the onus of the decision were thrown on the practitioner, the adherent placenta rate would go up.

Amendments to the scale of fees followed each other with such rapidity that they had almost the air of being auctioned from the chair.—An amendment proposed by Dr. C. H. PANTING for South-West Essex finally carried the day in a slightly modified form, as follows:—

> Fee for removal of adherent placenta involving exploration of the uterus, including all subsequent necessary visits during the first ten days, inclusive of the day of birth, £2 2*s.*
>
> This fee not to be payable when the fee of £3 3*s.*, for attendance at parturition and subsequent visits during the first ten days, is payable.
>
> Fee for suturing the perineum, for the treatment of post-partum hæmorrhage, for removal of retained placenta, or for any other operative procedure arising directly from parturition, including all subsequent necessary visits during the first ten days, inclusive of the day of birth, £1 1*s.*
>
> This fee not to be payable when either the £2 2*s.* fee or the £3 3*s.* fee already mentioned in the amendment were payable.

Another proposal was made by Dr. A. S. WILSON (for Holland, Lincs.) providing that the fee for attendance at or in connexion with an abortion or

miscarriage, including all subsequent visits during the ten days from and including the first visit, should be raised from £1 1s. to £2 2s., and this was also carried.

The other suggestions put forward by the Council were allowed to stand.

Birth Control.

A motion was introduced by Dr. BONE, that in the opinion of the Representative Body, where advice on birth control was given at any maternity and child welfare centre (voluntary or municipal) it should be given on medical grounds only, and at the discretion of the medical officer in connexion with any individual case, and not merely because it was asked for by the patient.—This met with disapprobation from Dr. LANGDON-DOWN, who thought it a gratuitous and pernicious invasion of medical liberty. The phrasing, moreover, was ambiguous; what was the meaning of "medical grounds," and did "advice" mean advice on principle or method? The doctor should have absolute liberty to dissuade the patient, or to urge birth control, and to suggest the method he thought best when necessary.—Dr. FOTHERGILL said that in Hove the Labour Party had been trying to establish that every woman who desired knowledge of contraception should have right to attend maternity centres; this would include single women. He agreed that the patient should not determine whether she was to receive information. It was not fitting that anyone should have the right to dictate to members of the medical profession what advice they should give to their patients.

Dr. G. JONES (Lewisham) considered that the unmarried woman had every right to receive information if she desired it. To withhold information would not make her chaste, and if she was determined to practise contraception she should be taught the best and safest methods. The alternatives to contraception were the infinitely greater evils of child murder and abortion. An altered form of the amendment, proposed by Dr. LANGDON-DOWN, was finally carried, and ran as follows:—

> In the opinion of the Representative Body the medical officer at any maternity and child welfare centre (voluntary or municipal) equally with any other medical practitioner, has the right to advise either for or against contraception by methods in accord with his individual judgment and responsibility, and should not be subject to dictation from the patient or her employer in this matter.

Anæsthetics in Midwifery.

Dr. J. YOUNG, speaking of the report of a committee on anæsthetics in midwifery, said that the danger in anæsthesia was due to the toxic effects of prolonged administration. There had been much propaganda in the press during the past year to make anæsthesia available for every woman. There was undoubtedly a risk that if this were made a right, women would be tempted to call for it at an unsuitable stage in labour and the dangers of childbirth would be increased. He asked that the following statement should be incorporated in the report: "In this connexion it is important to emphasise the fact that, unless widely guarded, efforts to extend the employment of general anæsthesia in labour may, by increasing the risk of instrumental delivery at too early a stage, tend to increase maternal mortality and morbidity."

Dr. CHRISTINE MURRELL said that the committee had covered the point freely in the following paragraph of the report: "The common form of anæsthetic used in midwifery in this country is chloroform, or a mixture containing chloroform. Chloroform given during labour diminishes the strength and frequency of the uterine contractions, and the semi-voluntary bearing-down efforts of the mother; it therefore prolongs the labour and increases the use of forceps with the risks that this entails."

Though Dr. YOUNG considered this paragraph to be inadequate, the meeting felt that it should not be asked to incorporate a fresh opinion without more consideration, and passed to the next business.

Ophthalmic Benefit.

Mr. BISHOP HARMAN described the work of the National Ophthalmic Treatment Board, which has now been in operation for a little over a year. The Board is a limited company, and composed of four members appointed from the British Medical Association, and four members of the Association of Dispensing Opticians. The members from each of the bodies have an equal voice on the Board, except on medical matters which are the concern of the medical members only. All expenses for the first year were borne by the Opticians' Association, but at the end of that time it was decided that the British Medical Association should give an equal guarantee, and for this purpose the sum of £1000 was voted. The scheme, Mr. Bishop Harman said, was now in vigorous working order. During the first three months of this year more cases had been treated than in the whole of last year, and during the fourth month the number treated had exceeded all those in the first three months. The value of the scheme lay in the opportunity it gave for the doctor to insist on the examination of his patient by an ophthalmologist. It was important that the profession should have information on the scheme, and its regulations put before it at once.

Dr. D. F. TODD proposed an amendment, for Sunderland, that the action of the Council in voting the sum of £1000 to a commercial optical company be disapproved. He thought the Association was creating a precedent of a serious nature if it stepped into business concerns. The result would be that opticians would again begin to treat without reference to an ophthalmic surgeon.

Dr. HELEN LUKIS opposed Dr. Todd; she thought that time was wasted and much harm done by the optician, who would provide a patient with glasses when the eye condition was referable to a generalised disease like nephritis. The eye was not in a water-tight compartment, and could not be treated without a knowledge of medicine, anatomy, physiology, and pathology. Her only complaint against the new Board was that it was insufficiently advertised.

Dr. PETER MACDONALD pointed out the inaccuracies in the Sunderland amendment. The National Ophthalmic Treatment Board was not an optical company, and the Council had not voted a sum, but had put up a guarantee.—Dr. POOLER was anxious to know how soon the scheme would apply in a practical manner to the rural areas.—Mr. BISHOP HARMAN replied that the Council would consider sending a circular to members of the Association.—Dr. TODD'S amendment was lost.

Lunacy and Mental Disorder.

In moving the annual report under "Lunacy and Mental Disorder," Dr. LANGDON-DOWN mentioned that the Mental Treatment Bill had largely followed the recommendations of the Association to the Royal Commission, and on one point—that relating to non-volitional patients—had adopted the advice of the Association in preference to that of the Commission. The Government had been urged to give the doctor signing documents the status of a witness, but the inclusion of this had not been granted. An

important change of onus had been introduced into the protection clause that no civil or criminal proceedings could be brought against a practitioner without the consent of the High Court, and that this should not be granted unless there was substantial reason to think he had acted in bad faith or without reasonable care.

Dr. D. ROXBURGH said that the Council had failed to obtain that immunity for the doctor which the Representative Body had laid down as a minimum. The profession believed that no doctor would sign a certificate without just cause, and it was no longer necessary to protect the lunatic from cruelty by law. The serious responsibility of giving certificates for lunacy was thrown on those members of the profession who probably had least knowledge of nervous diseases —the general practitioners. It should be laid on those who had the greatest knowledge of the subject. The protective clause was insufficient; how could a high court judge form an opinion without holding an inquiry?—Dr. LANGDON-DOWN demurred; if Dr. Roxburgh wanted the medical profession to be entirely free from risks, he wanted a world at present unattainable. The committee had been chiefly concerned for the welfare of lunatics, whose position was materially improved under the Bill. The report was adopted.

Vaccination.

Dr. E. LEWYS-LLOYD, in moving the adoption of the Public Health Report, asked that the paragraphs on vaccination should be left unaltered.—An amendment, however, was introduced by Sir ROBERT BOLAM, for Newcastle-on-Tyne, suggesting that Government lymph should be made available for general practitioners, and that every practitioner should receive the same remuneration from the Government as the public vaccinator.

Dr. H. KERR removed some misconceptions manifest in this amendment. It had been stated on a previous occasion that Government lymph was the most reliable variety, on the basis of the experience of public vaccinators. But it must be remembered that public vaccinators dealt almost entirely with infants, the reaction of whose skin was slighter. Hence the small incidence of "bad arms." Other producers of lymph had been compelled by the Government to standardise their products, and it was not likely that after enforcing this order the Government would be ready to step into the market as competitors of these manufacturers. Besides, if the Government lymph were made public how could the Ministry of Health control results or collect statistics? Communisation of Government lymph would, in any case, require special legislation. The amendment was also opposed by Dr. Temple Grey and by Dr. Lewys-Lloyd, who pointed out that the wording was not clear. The Government remuneration for vaccination was 1*s.*; it was the local authorities who paid a higher fee. The Newcastle proposal was not accepted by the meeting.

Motor Drivers.

Dr. R. G. GORDON said that the committee on tests for motor drivers was fortunate in having Prof. Joseph Barcroft, of Cambridge, as chairman. The Traffic Bill had now been passed and would probably reach the statute book at the end of the session. This provided for a declaration of fitness on application for a licence, and certain disorders had been made either conditional or absolute bars to driving. The age-limit for motor-cycle riding was to be raised from 14 to 16 years, and for driving public vehicles to 21. No public vehicle was to be driven for more than 11 hours in the 24, or for more than five and a half hours at a stretch.

Dr. C. E. DOUGLAS (Fife) said that the problem had been before the law courts for many years of deciding at what point the driver who had taken alcohol was safe, and at what point he became a danger. A definition of drunkenness published several years ago read to the effect that a man was drunk when he had lost control of his actions to such an extent as to be prevented from being able to execute carefully the work on which he was engaged. But it must be agreed that the point at which he became a danger was the point when he took alcohol into his system. From the beginning alcohol had a sedative effect on some of the higher centres, and work deteriorated in spite of the fact that the subject thought he was doing better. This was a point in preventive rather than forensic medicine. There were times when we were better without alcohol, and one of them was before driving a car. The meeting was unwilling to give a ruling on the subject, and proceeded to the next business.

Public Medical Services.

Dr. H. M. STRATFORD described the poor area of Kensington in which the London Public Medical Service was active. The younger doctors had considerable interest in the scheme, and found it satisfactory and useful. They were not in any sense antagonistic to the Association's scheme, but wished to propose that until that scheme was in working order the Association should support and encourage the London Public Medical Service.—Dr. BRACKENBURY said that the original scheme of this kind which had been put into practice had been initiated and supported by the Association. To encourage such schemes had always been the accepted policy.

Dr. FOTHERGILL said that since the beginning of the century the State had been initiating health services, which were now encroaching on private practice. An effective general medical service had been outlined in the proposals of the Council, but to bring the scheme into action the local authorities and voluntary bodies must share the principles involved. He therefore introduced a motion to suggest that the Council should make every endeavour to secure the acceptance by the central and local health authorities, voluntary bodies (hospitals contributory scheme committees, approved societies and employees' associations), as well as by all groups in the medical profession, of the principles advocated in their proposals. This was carried.

Annual General Meeting.

Prof. A. H. BURGESS, the President of the Association, took the chair at the annual general meeting. In announcing that Dr. W. G. Willoughby had been elected president for the year 1931–32, he said that this was the first occasion on which a medical officer of health had been chosen for the presidency.—Dr. WILLOUGHBY said that Eastbourne was preparing an enthusiastic welcome for the Representative Body in 1932.

WORK OF THE LONDON HOSPITAL.—Last year the 13,992 in-patients (839 beds) stayed an average of 18·55 days; the 645 deaths were a percentage of 4·83. The 89,972 out-patients made 461,297 attendances. The average total cost of each in-patient was £14 4*s.* 9*d.* and of each out-patient attendance 2*s.* 7*d.* At £265,311, the expenditure left a surplus of £19,043, but this satisfactory pecuniary position was due to legacies, which produced £68,840. Whereas 20 years ago the income from investments was only £20,810, it is now £53,117.

CANCER OF THE LIP, TONGUE, AND SKIN.

A STATISTICAL INQUIRY.

STATISTICAL inquiries made by Dr. Janet Lane-Claypon into the results of treatment of cancer of the breast and the uterus have been published from time to time by the Ministry of Health. She has now made an analysis of the literature of cancer of the lip, tongue, and skin, which forms No. 59 of the valuable Reports on Public Health and Medical Subjects issued by the Ministry.[1] Earlier reports in the series on cancer have dealt mainly with the organs usually affected in women. Cancer of the lip and tongue occur mainly in men but, contrary to accepted theories, the investigation does not incriminate smoking in itself as an important causal factor, though roughness and heat of the pipe or holder may be. Owing to certain technical similarities it has been convenient also to consider cancer of the skin in this report.

In considering treatment the percentage results are mostly set out in the form of two different survival-rates, the crude and the net survival-rates, the difference being as follows :—

(*a*) The *crude* survival-rate.—This is the percentage of survivors on the total sample treated whether by surgery or radiotherapy, and whether in one stage or in various stages of the disease. This rate regards all cases not definitely known to be alive and well as having died of cancer and gives too unfavourable a result.

(*b*) The *net* survival-rate.—Experience has shown (cf. Report on Public Health and Medical Subjects, No. 47, Ministry of Health) that patients "lost sight of" are probably not all dead. The correction made by ignoring them in addition to those dying of causes other than cancer secures the nearest approach to accuracy which it seems possible to obtain.

In calculating these survival-rates no patient has been included among the living who, though alive, was known to have a recurrence of the disease.

Cancer of the Lip.

A survey of the literature on operability suggests that only 10 per cent. of the patients who apply for treatment for new growths on the lip are in an inoperable stage. In considering the figures supplied by authors writing from 1878 onwards it must be remembered that the standard of operability has changed very considerably during the period under review. The operative mortality is not serious, except in advanced cases when removal of bone is necessary. Almost all the cases reviewed have been subjected to histological examination, even as long ago as 1865. The crude survival-rate after local excision is 27·3 per cent. after five years and 55·6 per cent. after three years. The net survival-rate is 29·4 per cent. after five years and 58·4 per cent. after three years. In cases where the glands were always removed the survival-rate is 80 per cent. There were no great differences between the three-year and five-year rates, for 90 per cent. of recurrences occur within three years. The available sample for all stages of the disease and for all methods of radiotherapy gives a survival-rate of 76·1 per cent. at three years after treatment. The results of treating recurrent cases are good enough either by operation or by radiotherapy to make treatment worth undertaking.

Cancer of the lip seems to take a slow course if it is not treated, and cases are on record in which the symptoms had been present for 36 years. Most cases, however, come for treatment within one year of the onset of symptoms. The lower lip is much more often affected, the proportions of the two lips being 95 and 5 per cent. It occurs 12 to 14 times more often among men than among women, although women are more apt than men to have cancer in the upper lip. The mean age of incidence is unknown, but the average age of application at hospital is 57 years, and the average age at death is 70 years. Metastases are rare.

The statistical data which have been collected do not support the common belief that smoking has an ætiological relationship to cancer of the lip; in 184 cases investigated, roughly one-quarter were affected with cancer at the place where they held their pipes. In the Finisterre district of France, both sexes smoke the short pipe, but cancer of the lip is as rare among women there as in other parts of the world, nor does the literature suggest any other common antecedent condition. There is, however, some reason to suppose that methods of smoking likely to damage the epithelium—e.g., the old clay pipe—may act as chronic irritant agents. The commonest precursory lesions are blebs and ulcers.

Cancer of the Tongue.

Literature on cancer of the tongue was found to give unsatisfactory data for the purposes of this report, and the results are only to be considered as relatively accurate. Apparently from 20 to 25 per cent. of all patients operated on are alive and well three years later, but the true survival-rate is probably somewhat higher than this. The operative mortality rate varies from 7 to 12 per cent. The samples available suggest that radiological treatment shows a better survival-rate than operation—37·8 per cent. and 59 per cent. in a small sample from the Radium hemmet, Stockholm. Both crude and net survival rates are higher for the three-year than for the five-year period, suggesting that three years is an insufficient interval on which to base statistics. The disease, on the whole, has a short natural duration—about 16 months. Patients usually apply for treatment seven or eight months after the appearance of symptoms; the delay is all the more serious in that the disease has such a short natural period and disseminates so rapidly. It reaches the glands early in the disease, and most surgeons prefer to treat them as part of the routine.

The mean age is rather lower than for cancer of the lip: 54 years, and the mean age at death is 61. Cancer of the tongue is about ten times as common among men as among women. The commonest antecedent condition recorded is syphilis, sometimes accompanied by other forms of chronic irritation. There is also a close relationship with leucoplakia with or without previous syphilis. No accurate data of the supervention of cancer upon syphilis are, however, available. The figures, so far as they go, do not suggest an association between smoking and cancer of the tongue. While the jagged edge of a tooth seems to have been an exciting cause in a few cases, statistics dealing with dental abnormalities are too scanty to be worth consideration. Betel chewing seems to produce cancer of the mouth in some parts of the East but not in other parts, and the literature does not indicate whether the difference is due to some variety in the composition of the quid or to different habits of chewing.

Cancer of the Skin.

The samples show wide variation in survival-rates but on the whole it appears that 40 to 50 per cent.

[1] H.M. Stationery Office. 1930. Pp. 121. 2*s*.

all patients treated are alive and well three years ter operation, and there seems little doubt that lequate radiological treatment will give a figure of) to 90 per cent. Despite some difference of opinion appears that results are more favourable with basal-lled than with squamous-celled cancers. Radio-herapy seems to give good results with relapsed ases. The disease takes a long course; the average eriod between the appearance of symptoms and the pplication for treatment is ten years. Less than a uarter of the patients apply for treatment within a ear. Most of the cases occur in the upper part of he head and face, and the majority of these are of he rodent type, which invades the glands very owly if at all. A few cases of sarcoma have been navoidably included; radiotherapy seems to give ood results in sarcomata and melanotic sarcomata. en and women are affected about equally with a ight preponderance among men. Apparently the sions in women nearly all occur in the upper part f the face. The mean age varies between 55 and 58, nd the mean age of death is 66 for men and 68·7 for omen. The precursors appear in the form of blebs, usts, warts, pimples, scabs, nodules, or injuries. seems reasonably certain that a high percentage, not all cancers of the skin, develop on a previously xisting lesion and that many of them are caused by equent irritation. The relationship of occupation ith cutaneous cancer has been exhaustively investi-ated; chimney-sweeping and mule-spinning are he two occupations which show a high percentage deaths from cancer of the scrotum. There is sufficient evidence to lay much stress on the relation-ip of the disease to rigours of climate, whether cold, eat, or general exposure.

CANCER OF THE EXTERNAL GENITALIA.

Cancer of the penis and scrotum form a large part all deaths attributable to cancer of the skin. In ancer of the penis the results obtained by treatment re very satisfactory, but curiously enough no data re available from any general hospital in this country. tatistics from abroad show that the crude survival-ate after three years is 47·4 per cent. and after five ears 41·1 per cent. It is probable that the results f radiotherapy are as favourable as those of surgery, ut no large series have been published. The average eriod between the onset of symptoms and the pplication for treatment is 14 months; the interval often extended to two years by preliminary ieffective treatment at home. There seems to be a igh proportion of cases showing enlarged but not et cancerous glands. Visceral metastases are rarely ound. The mean age is between 52 and 54 years. himosis seems to be a common antecedent and enereal disease was present in 28·4 per cent. of all ases. The disease is undoubtedly less frequent mong the circumcised.

The results of local removal of cancer of the scrotum re satisfactory; no series treated by radiotherapy on record.

The only large series of cases of cancer of the ulva is that published from Radiumhemmet, where he latest method is electro-coagulation combined ith distant radium. Of 60 cases so treated, 19 were live and well three years later.

QUEEN'S INSTITUTE OF DISTRICT NURSING.—At meeting of the council recently it was reported at up to the present time over £2800 had been received s a result of the National Gardens scheme, considerably ore than had been received to the corresponding date last ear.

INTERNATIONAL CONGRESS OF MICROBIOLOGY.

(FROM A CORRESPONDENT.)

THE first of the proposed triennial congresses of the International Society of Microbiology took place in Paris from July 20th–25th, mostly at the Pasteur Institute, under the Presidency of Prof. Jules Bordet. Some 800 members attended from many countries, and most of the honoured names in bacteriology appeared on the list of those registering. Some 30 British members were present.

The main subjects set for discussion were: variation in micro-organisms, scarlet fever, neurotropic filterable viruses, undulant fever, cholera, influenza, lipoids in immunity, and blood groups; in another section immunity in plants and spirochætes were included. In addition, a number of papers on general subjects were given—in any one of five languages. No one member could attend more than a limited number of meetings; but the full papers will be published in the Proceedings of the Congress as soon as possible. It was of interest to hear various views, often plainly contradictory to each other; thus, scarlet fever was held to be due to the specific toxin of the hæmolytic streptococcus, to allergy produced by the streptococcus, to a filterable virus; post-vaccinal encephalitis was specifically due to vaccinia virus, was not specifically due to this virus; B C G was capable of becoming pathogenic and could be split into a harmless and a virulent variety, was unchangeably avirulent. Little really new work was presented, but useful reviews of existing knowledge were given, and in this way and by the personal contacts which it affords a congress of this kind serves as an exceedingly useful clearing house of information and opinions.

A. R. Dochez's successful transmission, by means of a filtrate, of the "common cold" to apes and human beings—confirmed in another American laboratory—holds high promise. This and the extraordinary increase in the antigenic efficiency of diphtheria and tetanus toxoids produced by the addition of alum, discovered by A. T. Glenny, were two new items that attracted much attention. A useful discussion on the active immunisation of human beings against diphtheria by W. H. Park, G. Ramon, A. B. Wadsworth, and others led to general agreement that toxoid has high immunising power. Members were impressed with the lamentable tale of deaths and infection amongst research workers in yellow fever and in psittacosis. The Committee discussed nomenclature at several meetings, and arrived at certain general conclusions which will presumably be further considered at the next meeting of the International Botanical Congress.

Generous hospitality was extended to the guests, the Pasteur Institute playing a leading part. The general staff work by Dr. A. Dujarric de la Rivière and Dr. Harry Plotz was excellent. The only flaws were the failure on the part of many of the speakers to keep to the time allotted to them, and of others to speak slowly and clearly. An appreciation of the international friendliness manifest at all the meetings was made by Prof. G. H. F. Nuttall in his speech at the banquet.

The next meeting will be held in Berlin in 1933, and the announcement that the popular Prof. Martin Hahn would be President, and Sir Almroth Wright President of Honour, was received with enthusiasm.

NASOPHARYNGEAL FLORA.

A BACTERIOLOGICAL STUDY.

A STUDY of the nasopharyngeal bacterial flora of a group of the Manchester population during the period July, 1925–September, 1927, was carried out in the Department of Bacteriology of the University of Manchester by R. H. Blackburn, R. B. Boston, E. St. G. Gilmore, R. Lovell, S. P. Wilson, and Mrs. M. M. Smith.[1] The work was under the direction of Prof. W. W. C. Topley, F.R.S., and the expenses of the inquiry were defrayed by a special grant from the Ministry of Health. The scope of the investigation and the methods adopted were arranged in consultation with the Ministry's bacteriological staff. Its purpose was to follow the variations in the nasopharyngeal flora of a sample of the population of a large industrial city, and to determine whether any significant relation could be detected between fluctuations in the prevalence of any of those bacterial inhabitants of the nasopharynx which are usually credited with pathogenic potentialities, and fluctuations in the prevalence of respiratory diseases. Combined bacteriological and epidemiological inquiry has made it possible to describe the seasonal incidence of certain important bacterial species and to state how this flora fluctuates with the weekly sickness and mortality returns. The results are summarised as follows :—

(1) During the period July, 1925–September, 1927, a succession of epidemiological events in Manchester was associated with a succession of changes in the bacterial flora of the nasopharynx.

A winter and spring marked by a high incidence of respiratory disease, in the absence of any influenzal epidemic, was characterised by a high frequency of hæmophilic bacilli as a group, a low frequency of indol-forming strains within that group, and a low frequency of pneumococci.

During the following summer, with its customary fall in the incidence of respiratory disease, the frequency of pneumococci and of indol-forming hæmophilic bacilli remained at a low level, and the frequency of hæmophilic bacilli, as a group, declined.

During the following autumn and winter the frequency of all three bacterial groups rose to a high level. The numbers of indol-forming strains of hæmophilic bacilli commenced to rise in October, increased gradually until the following February, and rapidly during March, reaching a peak coincidently with the peak of the influenza epidemic, which visited Manchester in the spring of 1927. Thereafter the frequency of this bacterial group declined, at first steeply, then more slowly, remaining at a relatively high level after the epidemic had subsided. The frequency of hæmophilic bacilli, as a whole, showed a fluctuation very similar to that of the indol-forming sub-group, save that the rise commenced later, in December, 1926, and then proceeded steeply to a synchronous peak in March, 1927. The general form of the frequency curve of hæmophilic bacilli, as a group, did not, however, differ significantly from one winter to another, whereas the curve described by the indol-forming sub-group during the winter 1926–27 differed sharply from that described during the winter 1925–26.

The pneumococcal carrier-rate, which had remained at a low level between November, 1925, and October, 1926, rose sharply during the latter month to a level higher than any previously encountered. After a slight fall in December it rose to a higher peak in January, at the time when the influenzal epidemic commenced, and then declined slowly, with minor fluctuations, until the close of the inquiry in the following September. Whether this association of events was purely fortuitous, or was in any way significant, it is impossible to say. A far longer experience would be needed to establish the existence of a correlation between any variation in the nasopharyngeal flora, and fluctuations in the prevalence of a particular respiratory infection. We would suggest, however, that similar surveys, carried out in several localities and over considerable periods of time, would probably yield a definite answer to the question at issue, and that such an answer is worth obtaining.

(2) Although the frequency of hæmolytic streptococci in the nasopharynx varied over a considerable range during the period July, 1925–September, 1927, these variations showed no clear association with any recorded epidemiological events.

(3) The frequency of saccharose-fermenting, Gram-negative cocci was high throughout the whole period of inquiry. The results do not suggest that this group of bacteria is in any way related to the prevalence of respiratory disease.

(4) No evidence was obtained that pneumococci, hæmophilic bacilli, or hæmolytic streptococci are concerned in the causation of the "common cold," using that term in its widest sense, and not confining it to cases of acute suppurative nasal catarrh.

(5) The four bacterial groups studied in this inquiry occur far less frequently in the nose than in the nasopharynx. Their frequency in the latter situation does not differ sensibly from their frequency on the tonsils. Pneumococci and hæmophilic bacilli were isolated less frequently from mouth-washings than from nasopharyngeal swabs; in the case of hæmolytic streptococci and saccharose-fermenting Gram-negative cocci, the two methods of examination give essentially similar results.

[1] Ministry of Health Reports on Public Health and Medical Subjects, No. 58. H.M. Stationery Office. Pp. 26. 6*d*.

MEDICINE AND THE LAW.

The Evans Cancer Treatment Case: a Question of Costs.

THE Court of Appeal has overruled the decision of Mr. Justice Charles upon one aspect of Mrs. Burrell's claim against Mr. Evans, an unqualified medical practitioner, described in THE LANCET of May 31st p. 1189. Mrs. Burrell's cause of action, it may be remembered, was framed in three different ways. First, she contended that the defendant had made fraudulent representations by which she was induced to enter into the contract for treatment by the so-called Evans cancer cure. Secondly, she said the defendant warranted to cure her permanently and in three months, and broke his warranty. Thirdly she said he was negligent in his treatment of her. Every plaintiff, of course, must show in formal fashion, in a statement of claim or otherwise, the specific legal ground of his or her action and the remedy asked for. These three causes of action legally distinct, were naturally not readily distinguishable when the evidence was being offered on the whole of the case, and when the jury was trying to make up their mind on the merits and facts and on the trustworthiness of the witnesses. In the upshot the jury, after an absence of nearly three hours, failed to agree on the first and third branches of the claim —namely, the questions of fraudulent misrepresentation and of negligence; they did, however, definitely find in favour of Mr. Evans on the second matter— namely, the allegation that he had warranted to cure Mrs. Burrell in three months. Counsel for Mr. Evans, rightly claiming that he had at any rate succeeded on the issue of contract (as distinct from the issues of fraud and negligence), asked for his costs on that issue. Mr. Justice Charles refused the application on the ground that the case was tried as a

whole, that there was an intermingling of allegations and evidence, and that it would be inconvenient to give judgment on one point only if the action were to be tried again. The Court of Appeal has now said that this was wrong. Lord Justice Scrutton points out that it is not a mere matter of costs. If and when the case is set down for a new trial, the question will arise whether the plaintiff can again put forward her claim on the alleged warranty, and the defendant will then be entitled to say that the decision of the jury at the previous trial has closed that avenue. The question of the costs of this appeal was referred back to the judge who tried the case, with liberty to apply.

The disentangling of the costs of defending one part of a case from the costs of defending other parts is one of the mysteries which are solved without publicity in the taxing department of the law courts. In this particular case the problem of apportionment will be as intricate as usual. It it were a mere rule-of-thumb practice that a party, having succeeded on one out of three separate issues, was entitled to one-third of his total costs, it would be easy enough. Here, if it can be said that all three issues (and the evidence thereon) were inextricably intermingled, success on one issue alone will carry with it a larger proportion of the cost of the services of solicitors, the instructing and briefing of counsel, and the attendance of witnesses.

A Motor-car Insurance Claim.

The medical profession, which perhaps, more than any other, relies on the use of the motor-car, will note with interest a recent case on a motor-car insurance policy. The plaintiff's car caused injuries to a third person; the insurance company repudiated liability because the car was not "the insured car" covered by the policy, but a new car with which the plaintiff had replaced the original vehicle. Having had occasion to have the hood of the "insured car" repaired, the owner decided to buy a new car in view of the heavy cost of repair. He therefore handed over his old Lancia, paid £100, and became owner of a new Lancia. A telephone message was sent to his brokers to transfer the insurance to the new car, but unfortunately they did not carry out the instruction. The policy covered the liability of the motorist in respect of the use of "any motor-car (other than a hired car) provided that such car is at the time of the accident being used instead of the insured car." The judge had to decide whether the new car, purchased in the circumstances already mentioned, was being used "instead of the insured car" within the meaning of the policy. Mr. Justice Roche said there was no express or implied term in the policy that continuance of the ownership of the car originally insured was necessary. If the original car was burnt and the owner bought or borrowed another in its place, he would be covered if he could properly be said to be using the substituted car "instead of" the old one. The judge seems to have been influenced by the fact that the plaintiff bought a car of the same type as the original "insured car"; he refrained from deciding the position if the plaintiff had used a car of an entirely different type, "if, for instance, the insured car had been a baby Austin and he had used a Rolls-Royce." Doctors should keep an eye on the terms of their policies in this kind of matter. It is particularly important that the owner should be covered against risk of damage to a car or to third parties either where he has changed his type of car or where he is using a substituted car temporarily. If he should deem it advisable also to cover himself against liability for the expense of hiring a car when the insured car is under repair, he must see that this special provision is included.

Spiritualism and Testamentary Capacity.

In recent litigation over the will of the late Dr. Abraham Wallace, the court obviously shrank from the question whether, or to what extent, a strong interest and belief in spiritualism and psychic phenomena could amount to a delusion such as makes a person unfit to execute a will. Dr. Wallace died at Paignton last January at a ripe age, leaving an estate of about £10,000. There had been two wills, one of December, 1928, the other of November, 1929. The executrix, Mrs. Perkins, propounded the later will under which, subject to various small legacies, the deceased bequeathed to her the residue of his estate, expressing his gratitude for her care during his declining years. His children resisted this will, and also the will of 1928 under which Mrs. Perkins merely received a legacy. They contended that neither will was duly executed, that Dr. Wallace was not at the time of sound disposing mind. He had, they said, been interested for many years in spiritualism; after 1926 he became so obsessed that he suffered from delusions, and after his wife's death in November, 1928, his mind became so unbalanced that he was not fit to make a will. In the formal language of probate pleadings, the defendants put Mrs. Perkins to proof of the righteousness of the transaction; they claimed that Dr. Wallace died intestate, and they asked for letters of administration. The evidence was directed to two different points. First, there was the elementary question whether the wills were properly executed. Two domestic servants, who had signed their names as witnesses of the 1929 will, said that they had not seen Dr. Wallace himself sign the document. The second and bigger question was that of the testamentary capacity of the deceased. On behalf of Mrs. Perkins, several witnesses said that he was a strong-minded and capable man, whose mental power appeared in no way warped or twisted by his spiritualistic beliefs to the detriment of sound judgment. This opinion was supported by extracts from his correspondence on business and family matters. On the other hand, there was evidence that he believed himself in communication with his dead wife, who appeared to him at séances and indicated to him particular courses of conduct. Sir Oliver Lodge was in court on the third day of the trial but was not called as a witness, the case being settled on the intervention of Lord Merrivale. The President, after seeing counsel in his private room, pronounced against the execution of the 1929 will, expressing doubts whether any tribunal could have been satisfied that the testator affixed his signature in the presence of the two attesting witnesses, or that he acknowledged it in their presence. Lord Merrivale then pronounced in favour of the 1928 will, declaring it to have been duly executed by a competent testator who was aware of its contents and of the position of his affairs. All allegations made on both sides had been withdrawn by agreement, and a situation of some difficulty was thus ended. The President, in conclusion, remarked that this left Dr. Wallace untouched in the judgment of those who had great affection for him, his own family, his friends and confidants, "and, indeed, those who were his fellow-believers in occult matters about which it would not be proper that I should say anything further." Thus the main issue, inevitably raised in the circumstances of this particular case, remained undecided. Apart from any element of undue influence, the courts would hardly be prepared to say that no believer in the occult can make a

valid will. Evidence of insanity creates a presumption against testamentary competence, but it is always permitted to reply that the testator's delusions or insanity were irrelevant to the scope of the will, or insufficient to destroy or suspend testamentary capacity. Even where the presumption of insanity is supported by the fact of confinement in an asylum, it may be rebutted by satisfactory evidence that the will was executed during a lucid interval.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

HOSPITAL SUNDAY FUND AND SWEEPSTAKES.

Following on the threat to the Dublin Hospital Sunday Fund made by the Archbishop of Dublin (see THE LANCET, July 5th, p. 45) a meeting of the supporters of the Fund, held recently, decided to refuse grants to any hospital which took part in promoting, or received any benefit from, a sweepstake. In proposing the resolution, the chairman of the fund, the Earl of Meath, put forward no arguments for its adoption other than the attitude taken by the Archbishop and certain other supporters.

Having quoted the opinions expressed by the Archbishop, Lord Meath said that "the Hospital Sunday Fund had to decide whether they should fall in with the Archbishop's views or give up the Hospital Sunday Fund altogether." The proposal was opposed, though unsuccessfully, by Senator Sir Edward Coey Bigger. The situation created by the decision of the Hospital Sunday Fund is unfortunate. The decision gives no help to the solution of the financial problem of the Dublin hospitals; it merely asks the public to transfer their subscriptions from certain hospitals to certain others, and to be guided in their choice, not by the needs of a particular hospital or the value of the work it performs, but by special ethical views on gambling. Correspondents of the daily press have not failed to point out that the clerical upholders of the Sunday Fund are enforcing on the hospitals a more rigid ethical code than they think it necessary to apply in regard to the maintenance of their own churches.

WOMEN DOCTORS FOR INSURED WOMEN.

At a recent meeting of the Belfast Trades Council the Secretary read a letter from the Ministry of Labour of Northern Ireland, replying to the Council's request for the appointment of women doctors for insured women. The Minister pointed out that the Council were asking him to depart from the British practice. If he were to accept the view that women claimants should be examined only by doctors of their own sex it would mean duplicating most of the appointments of full-time or part-time medical officers throughout Northern Ireland, and consequently an increase in the administrative cost of the health insurance scheme. Any examination which was carried out by a referee was undertaken only to the degree necessary to enable a correct opinion to be formed as to the claimant's capacity for work. He should also like to inform the Council that on every occasion on which a woman was examined a nurse was present.

PAYING PATIENTS AT LEAMINGTON.—The coming centenary of the Warneford Hospital, Leamington, is to be marked by the erection of wards for private patients. The income limits have been fixed as follows:—Single persons, under £350 a year; married couples without children under 16, £450; widows and widowers with a child or children under 16, £450; married couples with a child or children under 16, £550. The medical fees are not to exceed 20 guineas.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

AN OFFICIAL REPORT ON THE LÜBECK DISASTER.

THE Minister of the Interior has published a report on the investigation made by his department in Lübeck. The report states that the Lübeck authorities had not informed the German Health Office before introducing the Calmette method of inoculation with B C G; it was their duty to do so, because in 1927 the Health Office had recommended some reserve in using this method. Moreover, after subcultures had been made from the original Calmette culture, it would have been their duty to ascertain that these were innocuous to animals before distributing them for use on infants. The supervision of the infants was also insufficient. The report states that Prof. Deycke is to be blamed because he had destroyed a great part of the subcultures, so that an examination was very difficult. After the virulence of the material used on infants was discovered at the autopsy on an infant who died during the treatment on April 26th, doses of B C G were still left in the hands of midwives and administered to infants. The Lübeck authorities were informed much too late by the doctors concerned, and the Central Government not before May 14th. The number of deaths has now increased to 52; some of the infants whose condition had improved have become worse again, and all the infants who have received cultures will be in danger for many years.

OPERATIONS WITH HIGH-FREQUENCY CURRENTS.

Prof. Heymann, chief surgeon of the Augusta Hospital in Berlin, lately read a paper before the Berlin Medical Society on operations with high-frequency currents. He said that the tissue may be cut in the same manner as with an ordinary sharp scalpel. Hæmorrhage is very slight, the blood from the small vessels being coagulated under the influence of the heat, whilst bleeding from larger vessels may be arrested by introducing the current into the artery forceps. The cut tissues remain dry because they are covered by a stratum of coagulated albumin, this being also a protection against infection. The method has been applied by Prof. Heymann in laparotomies, in growths of the brain, amputations of the mamma and of the extremities, and especially in furuncles and carbuncles. The great advantage is the arrest of hæmorrhage without ligatures; the drawbacks are the fact that the surgeon is dependent on the proper working of the diathermy apparatus, the muscular contractions caused by the currents, and the possibility of explosions produced by the proximity of ether and other anæsthetics. The difference between the action of diathermy and thermocautery is that the coagulation caused by diathermy is very superficial, not exceeding 2 mm. in depth. The idea that wounds produced by diathermy heal less rapidly than wounds madeby a scalpel is erroneous. In the course of the discussion Prof. Heymann's views were generally confirmed. The method was considered to be especially valuable for cosmetic operations.

INTERNATIONAL HYGIENIC EXHIBITION.

In 1911 an international exhibition of hygiene was held in Dresden, and many of the exhibits were preserved to form a permanent museum. This museum has now been organised and was opened this summer, together with a great international exhibition, under the patronage of the German and foreign governments. The German government

presents an historical exhibition of the development of hygiene and of medicine in the past 100 years. The German cities show models of sewage fields, slaughter houses, public baths, market halls, methods of food control, and people's kitchens. There are also on view model clinics for mothers and infants, and for tuberculous, venereal, and alcoholic patients. A special department is devoted to superstition and quackery, where the advertisements are compared with their alleged results. This department is amusingly and cleverly arranged, and since it evidently attracts the public it provides valuable propaganda against quackery. Other departments are concerned with gymnastics, industrial hygiene, hygiene of dwellings, food, and clothes. A big hall is devoted to the modern hospital. There are models of operation theatres, sick rooms, hospital wards, isolation wards, hospital dispensaries, and laboratories. Another part of the exhibition is devoted to the hygiene of infants, where the measures used in the attempt to decrease infant mortality are demonstrated. Special exhibits illustrate the combat against tuberculosis and against cancer. Of the foreign government exhibits that of Russia is the largest. It is designed to show the great progress of hygiene since the institution of the Soviet system. The other governments have exhibited diagrams and statistical tables concerning hygiene in their respective countries. The nucleus of the exhibition is the permanent museum, and its aim is to popularise hygiene not by dull lectures and statistical records, but by vivid illustrations. The exhibition will be open until November and is well worth visiting.

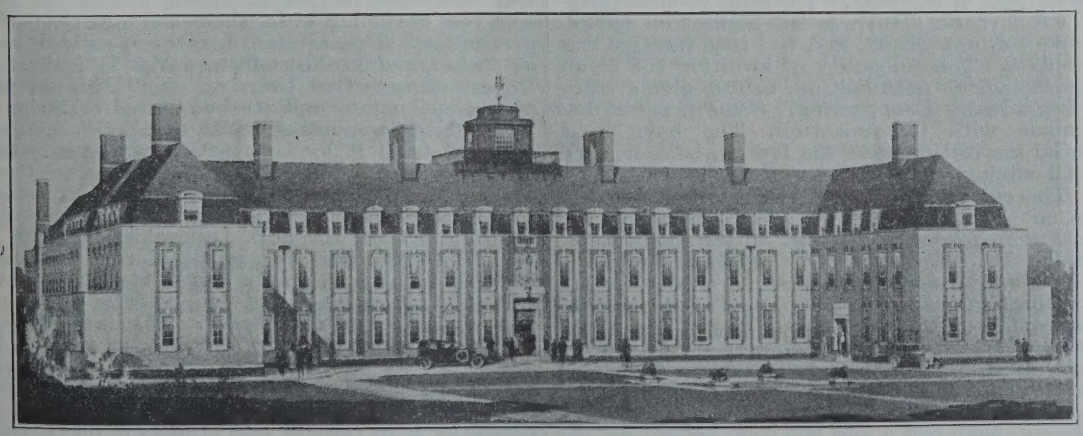
EXPERIMENT ON PATIENTS.

The German Health Council, a representative body connected with the Health Office, composed both of doctors and laymen, has been deliberating on experiments on patients. The Council holds that such experiments are necessary for medical progress, but must be made in accordance with medical ethics. Experiments which might as well be done on animals, and experiments on moribund patients without the intention of saving life, are to be avoided. Powerful new remedies should not be used for human beings until tested on animals, and then only by agreement with the patient. Experiment in hospitals should only be made by the chief doctor or under his personal control. In medical publications the respect due to the person of the patient must never be neglected, and the responsibility of medical men in this regard must be explained to medical students.

MARGATE AND DISTRICT GENERAL HOSPITAL.

THE work of the old Cottage Hospital at Margate has been transferred to a new building in St. Peter's-road, and the hospital was officially opened by Prince and Princess Arthur of Connaught on July 3rd. The new institution, which is to be run by the same staff as the old, is placed on a fine open site facing St. Peter's-road. On the left of the entrance hall are the offices and on the right the X ray department. The latter department was placed here in order to be equally convenient for in-patients and out-patients and also to allow room for expansion. All the wards and the theatre have been fitted with plugs so that patients can have treatment with X rays in bed. The radiological machinery is in a room beneath the filming room, so that no noise is heard in the latter. In the north-west wing is the out-patients' department with consulting, surgery, and ophthalmic rooms and a theatre. The wards are on the south side, away from the road and facing a country view. There is accommodation for 14 paying patients in wards containing one, two, or three beds. On the first floor there are two large surgical wards, two maternity rooms with vita-glass windows, and a children's ward with eight cots. Staff rooms are in the centre of the building and nurses' and maids' bedrooms, bathrooms, and lavatories on the third floor. The operating suite is on the first floor of the north-west wing. The hospital is heated by coke-fed boilers in the basement; these can be converted for oil-burning at a small cost if desired. The apparatus is a low-pressure hot water system and there is a minimum of unsightly drop-piping. The building is distinguished by a turret, from which a fine view of the surrounding country and sea is obtained. Precautions have been taken against breakdowns in the various supplies; gas stoves and gas lamps have been installed, and the beamless electric light in the theatre can be supplied with current from storage batteries. Every bed has a window facing south, or nearly south, its own electric light overhead, and a reading lamp on the locker.

The building and equipment cost £70,000; a sum of £57,000 has been subscribed, and a further £5000 was handed to the Prince in purses at the opening ceremony. The hospital thus needs another £8000 to be cleared of debt. The architects are Messrs. Adams, Holden and Pearson of London, and the general contractors Messrs. Reg. Elliott and Co., Ltd., of Margate.



The New Margate Hospital.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of eight districts of differing local government status and in various parts of the country.

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5yr.) mortality.	Maternal mortality from childbirth.
Cambridge B. (60,730)	11·8	12·3	0·87	1·73	2·6	1·7	47/35	14	4·2
Barry U.D. and Port (39,010)	17·5	11·0	1·00	1·61	1·4	1·6	70/39	38	5·8
Darwen B. .. (37,780)	12·9	14·7	0·55	1·72	3·4	2·5	86/49	—	8·2
Spenborough U.D. .. (30,780)	14·3	14·6	0·58	1·36	3·1	3·3	79/25	47	4·5
Ramsgate B. (31,440)	17·4	13·7*	0·80	2·20	2·1	1·8	75/35	22	9·1
Weston-super-Mare U.D. (27,620)	8·6	13·5	0·61	2·17	1·6	2·6	71/42†	—	0·0
Taunton B. (24,860)	15·9	12·7	0·84	1·45	2·0	2·4	52/30	12	7·5
Hereford R.D. (13,060)	15·5	13·9	0·92	1·68	2·1	2·9	104/49	—	5·0

Stillbirths per 100 live births: Cambridge (notified), 4·3, Barry 4·8, Darwen 5·7, Spenborough 4·7, Ramsgate 2·9, Weston-super-Mare 3·8, Taunton 3·0.

* Standardised 11·4. † Death during first week only.

Cambridge.

Dr. Andrew J. Laird points out that owing to the rise in the death-rate and the fall in the birth-rate, there was in 1929 for the first time no natural increase in the population of Cambridge. The increased death-rate was mainly of older people during the exceptionally severe weather of the first quarter and attributed to influenza, diseases of the heart, and bronchitis. Cambridge did not, however, suffer from influenza in 1929 so badly as many other places. The deaths numbered 38, which may be compared with 56 in 1927, 40 in 1922, 127 in 1918, and 33 in 1919. The infant mortality was exceptionally low after the first month. Thus out of 34 infant deaths, 25 occurred in the first four weeks, and only nine during the rest of the year. The number of notifications of diphtheria (240) was the highest on record. The type was not severe, and the case fatality was 4·1 per cent. The old policy of awaiting the result of bacteriological examination before giving antitoxin is gradually disappearing. Some progress has been made with immunisation. The boys in a residential institution were the first to be done, and a special clinic was opened towards the end of the year. The only case of small-pox was a stewardess on the s.s. *Tuscania*. She had a mild attack, the contacts were revaccinated, and no secondary cases occurred. Dr. Laird estimates that from 400 to 500 more houses are needed. The health committee has been authorised to build 70 to meet the needs of certain families—viz., those from houses for which a closing order has been made; those from houses requiring substantial repairs; and those with large families who are unable to pay the rent of a municipal house. Thirty of these houses have been erected, and are occupied, and a site has been bought for the remaining 40. The Cambridge Housing Society has also built a third group of houses (making a total of 61) for the accommodation of large families.

Caravan dwellings are on the increase, and it is suggested that Cambridge may have to adopt the Birmingham scheme of setting aside parking places provided with all necessary requirements.

Barry.

Dr. Percy W. Kent says the chief occupation of the inhabitants is at the docks in connexion with the export of coal. The continued slump in trade has led to prolonged unemployment and an increase in casual labour, but so far the health of the community has not been affected. The municipal hospital is at present only used for accidents and surgical cases. The question of its extension has been under consideration for some years. Medical, children's, and maternity wards are needed, and also accommodation for massage and electrical treatment. During 1929 the Barry Chamber of Trade gave £1000 for the purchase of a new X ray apparatus. The water-supply of the district has been unsatisfactory for several years but it is hoped that the new supply from Taff Fechan will be available during 1930. The problem of inadequate housing still exists, and there is overcrowding in several parts of the district. Dr. Kent points out that local authorities select the best tenants although they are in a better position than private owners to supervise undesirable tenants. He regrets that the suggestion of the sanitary inspector some years ago that a certain part of the housing estate should be set aside for such tenants was not acted upon. Until some such experiment is tried the problem of the undesirable tenant will not be solved. Dr. Kent also points out that the charges for subtenancies should be controlled. Several tenants receive more rent from subtenants than they themselves pay for the whole house. Efforts are made to encourage clean milk production, but some of the producers do not coöperate. During the year one cowkeeper was fined for failing to keep the flanks and udders of his cows clean.

The work of the port sanitary service has been greatly altered during recent years by deratisation. The inspection of vessels of from 2000 to 5000 tons and the estimation of the rat population takes a sanitary inspector and a rat-catcher from two to three hours, and the fumigation occupies another three hours. There were about two black rats to three brown rats amongst those destroyed on ships during 1929.

Darwen.

Dr. James Robertson says the water is mainly a soft moorland supply. The water in the reservoirs is treated with sodium carbonate before sand filtration and lime-stone is placed in the bed of the brook. Analysis of the tap water shows only gr. 1/300 of lead per gallon. The rainfall for the year was about 57 inches, and in November nearly 11 inches. Dr. Robertson says that the river should be covered in at various points and its bed paved. During the year a large amount of refuse and debris had to be removed from it by corporation workmen. Owing to the lack of small and low-rented houses there is some overcrowding, mainly from the occupation of houses by more than one family. The joint town planning scheme for N.E. Lancashire has just been completed, and it is now proposed that the area be divided into two groups with statutory powers. Out of 90 observations the time-limit for black smoke was exceeded in six instances. The limit allowed is five minutes per hour for one, two, or three boilers and seven for four or more. Owing to the unprecedented depression in the cotton trade a number of mills have been permanently closed, several have been closed for long periods, and others are on part-time. This has resulted in a very great diminution in the

town's consumption of coal and may have to some extent accounted for the increase in the sunshine registered. Thus the record for 1929 was 1409·8 hours as compared with a 20-years' average of 1146·4 hours. There is no local maternity home or children's hospital, but the poor-law infirmary situated in Blackburn admits maternity and other cases from Darwen. This hospital also has an orthopædic unit.

Spenborough.

Dr. L. Pickering-Pick reports that the deaths were 44 more than the average for the previous five years. One peculiarity of the returns was the large excess of female deaths—viz., 273 out of 451. The deaths under one year were 50 per cent. greater, and those from 1 to 25 years exactly double those in 1928. The increased mortality from respiratory diseases affected the two extremes of life. The infant mortality-rate of Spenborough was ten higher than the rate for the 157 smaller towns, but the neonatal deaths were five fewer than in the previous year. There is no maternity hospital in the district, but the municipal hospital of Bradford and the Heckmondwike and Batley maternity homes receive Spenborough women on payment. The isolation hospital arrangements are unusual—Spenborough was formed by the amalgamation of Cleckheaton, Liversedge, and Gomersal, and the cases from each of these three districts still go to different hospitals. There is no general hospital in the district, and the hospitals at Bradford, Dewsbury, Batley, and Leeds are utilised. There were 82 cases of small-pox with no deaths. The cases constituted two small epidemics.

Dr. Hilda A. Channon (part-time) conducts an antenatal clinic. In 1928, 93 cases made 251 attendances, and in 1929, 111 cases made 325 attendances. The mothers attend well on the whole, she says, and are beginning to introduce their friends, but the standard of general physique among the pregnant women of the district is depressingly low. Free dental treatment has been provided, but only a few can be persuaded to avail themselves of it, and several motners state that their dentist has refused to extract teeth on learning that they were pregnant.

Ramsgate.

Dr. W. J. Bannister states that the remaining 20 of the 360 houses on the council's Whitehall estate have been completed, but that there is still a demand for the non-parlour house at a low rental. Through the generosity of Dame J. Stancombe-Wills a maternity ward of eight beds, costing about £10,000, is being added to the general hospital. Dr. Bannister has advocated the institution of an open-air school for some years, and says there are many children who would benefit greatly therefrom. As the borough will not face the cost, he suggests that provision be made for open-air education for special classes of children throughout the year in connexion with the proposed new centrally situated school. This appears to be an opportunity for the "Derbyshire" type of school. The council's station for the sterilisation of cockles from Pegwell Bay has been discontinued, and those engaged in the trade have been notified that they must provide their own means of sterilisation to the approval of the medical officer of health. The hours of sunshine were 1897·8, and the inches of rainfall 18·79.

Weston-super-Mare.

Dr. A. E. Remmett Weaver, who was appointed on the resignation of Dr. John Wallace, also performs duties for the county council's school medical service. In commenting on the increased infant mortality, he attributes this to an exceptional number of accidents at birth. Of the 17 deaths of infants, ten occurred from a few hours to a week after birth, and in four instances inquests were necessary.

For years the isolation hospital has been regarded as inadequate. At a conference with the county council it was decided that Weston must either build a new hospital, enlarge the present one, or join a combination scheme. Accordingly a scheme has been approved for the addition to the present hospital of a 12-bed scarlet fever pavilion, a 10-bed observation block, an administrative block, and a new laundry and mortuary. The maternity and child welfare work is mainly organised by a voluntary association. There are no maternity beds in the district, but when the extension of the general hospital was planned, a ladies' committee raised £6500 for the provision of maternity wards. The old X ray department has been converted into maternity wards, which have not yet been opened, as no funds are available for administration and maintenance. Excellent water has been available from a spring in the limestone at Banwell since 1924. The water is pumped to a tower on Worlebury Hill and another lower level reservoir. The village of Banwell is to have a piped water-supply and a drainage scheme contemporaneously. As these schemes may threaten the purity of the spring, Weston's water-supply is being chlorinated. In the eastern part of the district, the only direction in which Weston can expand, there is an ancient system of land drainage by rhynes. Complaints of flooding have arisen owing to the inability of the rhynes to carry off surface water during heavy rains. An endeavour is being made to adjust this matter. The council erected 20 houses during the year. The hours of bright sunshine were 1790·5, as compared with an average of 1455·3 for the past ten years. The heaviest fall for one "rainfall day" was 2·99 inches on August 3rd.

Taunton.

Dr. John Allen reports that the water had to be cut off from 6 P.M. to 7 A.M. from April 29th onwards, and that it was not found possible to resume a continuous supply until Dec. 10th, after the heavy rainfall. A plant for treating the water with chlorine was installed in February. The rainfall on the watershed during 1929 was 41·6 inches, but 27·7 inches fell during the last quarter. Steps are being taken to increase the present sources of water-supply.

During September and October a special survey was made of all the houses in the town which were without through ventilation. The survey gave a total of 771 houses of this type, with rents varying from 2*s.* 6*d.* to 6*s.* a week. Most of these houses are arranged in courts. There is no inside sink or water-supply, only a tap and gully in the court. Coal and refuse are stored in a space under the stairs, and there is no ventilated food store. Sixty-six of the houses are classed as much below the condition of the remainder on account of marked lack of light and air, serious dampness, infestation by vermin or dilapidation. The shortage of houses prevents closing orders from being made, and many of the tenants cannot pay more than 6*s.* a week. At the time of the survey only 12 of these houses were unoccupied. The total houses in the borough in 1921 were 5376, so that about one in seven is of the type mentioned in the survey. Amongst other needs mentioned by Dr. Allen are a proper dustbin for each house, better drinking water facilities in the schools, and less primitive methods of retailing milk.

Hereford.

Dr. R. Wood-Power's district includes 39 parishes completely surrounding the city of Hereford, and has an area of 65,669 acres. In most of the parishes, shallow wells or springs provide the water-supply, and most of the "dip" wells are not protected, as they might be, from surface pollution. Dr. Wood-Power regrets that more advantage is not taken of the city's supply in all the parishes surrounding it. There were 21 notifications of diphtheria in nine parishes. Ten of the cases occurred in one house under unsatisfactory home conditions. This large family has now been provided with a "council" house. The council has formulated a scheme for

assisting owners under the Housing (Rural Workers) Act, 1926, but no applications were received during 1929. Some 2500 hop-pickers came from outside the county, chiefly from South Wales and Staffordshire, to 22 farms in the district. As few as six went to one farm, and as many as 700 to another. Much greater regard for the welfare of the pickers is shown than formerly. Some farms have canteens, and fresh meat and fish are obtained by the periodical visits of tradesmen.

MENTAL HOSPITAL REPORTS.

THE 116th annual report of the GLASGOW ROYAL ASYLUM records that there were 536 patients in hospital at the end of 1929, 155 of them being private cases. There were 21 more voluntary than certified cases among the 156 admissions. The recovery-rate was 34·5 per cent. and the death-rate 8·9 per cent. The medical superintendent pleads for the establishment of a psychiatric institute similar to that of New York. The asylum is soon likely to have a new charter to enable it to change its name to one more consonant with modern ideas. Wireless has now been installed throughout the hospital and has been a great boon. The occupational therapist submits a special report showing the success achieved in her department. The dental surgeon reports the total of 252 attendances and 244 extractions under local anæsthesia. There is a full consulting staff, but as yet no means of treatment by hydro- and electro-therapy.

The KINGSEAT MENTAL HOSPITAL at ABERDEEN had 701 certified patients on the register at the end of last year, and 15 voluntary cases were admitted during the year. No less than 11 of the admissions were suffering from general paralysis and all were too feeble for malarial treatment. Some improvement was obtained in two cases from graduated injections of sodium nucleate. Aberdeen has done little for its mental defectives, and 12 adult cases were admitted to the mental hospital during 1929. Despite these difficulties, the institution showed a recovery-rate of 31·4 per cent. and a death-rate of only 8·8 per cent. The question of the appointment of a dentist is under consideration, and the visiting commissioner urges the advisability of occupational therapy on a wide scale. The medical superintendent pleads for some way of keeping the senile case out of the general ward, possibly in a bungalow type of hospital. A veranda and solarium have been added to the Maudsley Parole Villa. Many patients work on the farm and take a keen interest in it. Four of the staff obtained their R.M.P.A. certificates during the year.

The MONMOUTHSHIRE MENTAL HOSPITAL at ABERGAVENNY had 1244 patients on the register at the end of last year. The recovery-rate was 27·5 per cent. and the death-rate 6·5 per cent. There was an outbreak of typhoid in the spring, and after prolonged efforts a chronic carrier was isolated in March, but there seems to be another undetected, as two more cases occurred in December. A small X ray apparatus has been installed. The visiting surgeon has been called in twice and has operated once, and the dental surgeon has visited weekly. Full parole has been allowed to 46 men, while 78 men and 25 women have had liberty within the estate. During the year eight nurses passed the final examination for the nursing certificate.

The COUNTY AND CITY OF WORCESTER MENTAL HOSPITAL at POWICK had 1047 patients in the hospital at the end of last year. The recovery-rate was 38·7 per cent. and the death-rate 5·6 per cent.; post-mortem examinations were made in 71·7 per cent. of the fatal cases. The general health was good, but there was one case of scarlet fever. The dentist examines all patients on admission and supplies treatment when necessary. The committee are considering the installation of electricity and the reorganisation of the sewage disposal. Six men have had parole beyond the estate and 33 men and 8 women within the grounds; two patients were allowed out on trial and two wards are administered on the open-door principle. The visiting commissioners wish that these privileges could be more widely extended. Five male and three female nurses obtained their R.M.P.A. certificates during the year.

The CHESHIRE COUNTY MENTAL HOSPITAL at PARKSIDE had 1303 patients on the register at the end of the year, and there has been a certain amount of overcrowding on the male side; this has been met by transferring 18 men to workhouses. The recovery-rate was 28·7 per cent. and the death-rate 7·47 per cent. The general health was satisfactory, apart from a severe epidemic of influenza in the spring. Of the 13 cases of general paralysis admitted, six were suitable for malarial treatment, with the result that three were discharged and one was considerably improved. Light treatment was given to 33 patients for mental illness and to 116 for physical reasons; 55 patients were treated with radiant heat, baths, sprays, and massage. The report is illustrated with photographs of a hammock fitted with a vita-glass canopy and of the hydrotherapy treatment rooms. In the occupational therapy department 76 women and 27 men are occupied in various handicrafts, while 52 men and 32 women were introduced to various games. A new room is to be added to this department shortly. The laboratory has undertaken the examination of specimens for the Macclesfield Town Council. The report includes notes by members of the staff on the treatment of varix by injection of quinine and urethane and the relation of the cause of death to the type of insanity. It is well known that cases of dementia præcox are particularly liable to tuberculosis; it was found that five out of 68 schizophrenics and 41 out of 67 melancholics died of heart disease and chronic nephritis. The paranoid and cycloid types predominate in the list of deaths from malignant growths, while the epileptic imbeciles succumb most easily to colitis and pneumonia. There is also a report from the laboratory showing that 1911 routine investigations were made and that a small outbreak of dysentery in June and four sporadic cases of typhoid caused a good deal of work. The Lange colloidal gold test has given consistently satisfactory results. Eight nurses and one attendant obtained the R.M.P.A. certificate, bringing the total to 48 nurses and 27 attendants.

The 101st report of THE LAWN, LINCOLN, omits the usual historical introduction, as this institution is now well known. The year's work shows a further increase in the number of admissions, these being 43 on an average number resident of 65, and for the first time the voluntary boarders outnumbered the certified patients (24 to 19). Of the certified cases the majority would have been suitable for admission under the new temporary treatment order proposed in the Mental Treatment Bill. The recovery-rate was 35·29 per cent.; it was 42·85 per cent. for females but none of the male admissions were recoverable cases. The general health was good, and there was no epidemic disease. A class in folk-dancing has proved a great success, especially for patients who lack spontaneous activity. Handicrafts of various kinds have been taken up during the year, and it is hoped before long to employ a full-time occupations officer. The new veranda attached to the admission and convalescent ward has enabled quiet borderline and convalescent cases to be treated separately in the open air under glass permeable to ultra-violet rays. The financial situation of this excellent institution is unfortunately constituting a serious problem, and very few patients can be received at rates less than the cost of £4 4s. per week. The visiting commissioner urges the governors to consider making a wide appeal for funds, as it would be a calamity if the amount of relief they afford had to be reduced. The hospital has no endowment and receives practically no support from voluntary contributions. It is to be hoped that Lincolnshire will soon realise the importance of early treatment in the only hospital in the county which

can receive voluntary boarders, and supply the financial help which will enable its charitable work to be extended.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 19TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 126 (last week 138); scarlet fever, 1817; diphtheria, 1221; enteric fever, 108; pneumonia, 563; puerperal fever, 35; puerperal pyrexia, 100; cerebro-spinal fever, 11; acute poliomyelitis, 13; acute polio-encephalitis, 4; encephalitis lethargica, 18; dysentery, 6; ophthalmia neonatorum, 120. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 22nd–23rd was as follows: Small-pox, 241 under treatment, 3 under observation; scarlet fever, 1762; diphtheria, 1991; enteric fever, 33; measles, 284; whooping-cough, 77; puerperal fever, 24 (plus 14 babies); encephalitis lethargica, 121; "other diseases," 18. At St. Margaret's Hospital there were 18 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox or enteric fever, 16 (1) from measles, 5 (2) from scarlet fever, 22 (2) from whooping-cough, 32 (9) from diphtheria, 39 (9) from diarrhœa and enteritis under two years, and 18 (2) from influenza. The figures in parentheses are those for London itself.

Six deaths from diphtheria were reported from Liverpool and four of the fatal cases of diarrhœa were at Manchester.

The number of stillbirths notified during the week was 327 (corresponding to a rate of 47 per 1000 births), including 57 in London.

OBITUARY

ALFRED BERTRAM SOLTAU, C.M.G., M.D., F.R.C.P. Lond., F.R.C.S. Eng.,

HON. PHYSICIAN TO H.M. THE KING.

WE regret to announce the death of Dr. Alfred Soltau, of Plymouth, which occurred on Saturday last, July 26th, in a London nursing home, at the age of 55.

Alfred Bertram Soltau was born in 1876, the eldest son of George Soltau, a nonconformist minister, who was for a time governor of Dr. Barnardo's Home, and then took charge of a mission church in Tasmania. The son received his early education in Tasmania, and returned to England for his medical training. He entered the school of the London Hospital, where he obtained a scholarship and where afterwards he obtained prizes and distinctions in many subjects, as well as being Anderson Scholar in Clinical Medicine. In the intermediate and final examination for the M.B. London he obtained first-class honours, and graduated in 1900, taking the diplomas of the Conjoint Board in the same year. In 1902 he proceeded to the M.D. and obtained the F.R.C.S. Eng. Deciding to practise in the country he returned to Plymouth, where his family had been well known for several generations; he was appointed honorary physician to the Devon and Cornwall Ear and Throat Hospital and later to the South Devon and East Cornwall Hospital, and was rapidly recognised as a leading practitioner in the district. He became president of the Plymouth Medical Society and of the St. John Ambulance Association for the area, and also of the local division of the B.M.A. He was a prominent citizen as well as a leading practitioner, for he took a keen interest in politics, being president of the Plymouth Conservative and Unionist Association at the meeting in the city of the National Unionist Conference, while his civic activities included membership of the Plymouth Borough Council (1919–25) and chairmanship of the Public Health Committee. These various duties would appear to have given enough work for a medical consultant, but Soltau added to them a practical participation in military medicine. He was one of those who apprehended that a great war would come, and believed in the need for the country to prepare for it. In 1905 he took a Commission in the Devon Volunteer Brigade Bearer Company, and he raised and became the first commanding officer of the 2nd Wessex Field Ambulance (T.F.).

In 1914 the war brought him to the fore. He had the honour and joy of going out to France in command of his ambulance. Both the ambulance and the commanding officer were tested severely, and survived with credit. Soltau's services were recognised by promotion in 1916 to the post of consulting physician to the First and Second Armies, which carried with it the rank of Colonel, A.M.S. He was one of the first consultant officers to be appointed from amongst those who had served in the forward area, and he was familiar with the plight of the various medical units, and able to view their needs and difficulties with sympathy. He realised that a consulting physician and consulting surgeon in the field has vast opportunities beyond the obvious duty of seeing and treating difficult cases, inasmuch as one of the most important functions of the medical service is to maintain the Army in health, and to return to duty as quickly as possible those soldiers suffering from minor maladies. In the difficult days of the autumn of 1917, when the fighting round Passchendaele was dying down, Soltau was consulting physician to an army which contained over half a million men, and in recognition of his activities, and especially because of work done for the gassed, he was appointed in 1918 consulting physician to the War Office and the Ministry of Pensions for gassed cases. He was mentioned in despatches four times; awarded the C.M.G., in 1916, C.B.E., 1919, the Croix de Guerre (France) in 1918, and created Commendador D'Ordre d'Aviz (Portugal) in 1919. In 1924 he was appointed honorary physician to His Majesty the King; A.D.M.S. 43rd (Wessex) Division in 1922, and in 1927 honorary colonel, R.A.M.C., 43rd Wessex Division (T.F.). He was a clinician and interested in all things medical, and not a writer, but his publications include the Section on Gas Warfare in the Official Medical History of the War, and he was joint author of the Ministry of Pensions' Notes on Certain Diseases of the War. In 1919 he took the M.R.C.P. Lond., and was elected to the Fellowship in 1925.

In 1903 he married Edith Mary, eldest daughter of W. E. Watts, of Plymouth, by whom he had one son, George Richard Bertram, serving in the West Yorkshire Regiment, and one daughter. Dr. Soltau died after a long illness on July 26th, and was buried at Hendon Park Cemetery, Mill Hill, on July 30th.

JOHN STEVENS, M.D., F.R.C.P. Edin.

Dr. John Stevens, who died at Edinburgh on July 23rd, was one of the best known practitioners of the city. He graduated at Edinburgh with first-class honours in 1884, and received the gold medal for his M.D. thesis three years later. He became resident physician at the Royal Infirmary, and was admitted a Fellow of the Royal College of Physicians in 1894. He was early associated with the Edinburgh Medical Guild, of which he was honorary secretary and treasurer, and he held strong opinions on the status of practitioners. His interest in these matters led him into active work for the Edinburgh branch of the British Medical Association, and he became a member of the Scottish Committee and a representative on the Council of the Association. Tenacious but considerate in argument, he carried much weight among his colleagues, and his earnest enthusiasm gained their respect. His presence will be much missed at the deliberations of the Council and of the Representative Body of the B.M.A.

THOMAS OUTTERSON WOOD, M.D. Durh., F.R.C.P. & S. Edin., M.R.C.P. Lond.

Dr. Outterson Wood, whose death was announced in THE LANCET last week at the advanced age of 88, died at Torquay, where he had lived for some years after retirement from practice.

Thomas Outterson Wood was born at East Rainton, Durham, in 1843, the son of a father with the same name. He received his early education at Houghton-le-Spring, and entered the Newcastle School of Medicine as one of the first students. He finished his medical education at St. Bartholomew's Hospital, and qualified in 1868 as M.R.C.S. He returned to Newcastle as house surgeon to the infirmary, but an opening having occurred for a resident at a private asylum nearby, he resolved to practice in the special branch of psychiatry which already had attraction for him. In course of time he became physician-superintendent to the Dunston Lodge Asylum, where his first appointment had been obtained, and while there he took the F.R.C.S. and the M.D. Durh., acquiring later the M.R.C.P. Lond., and being elected F.R.C.P. Edin. While at Dunston Lodge he was appointed lecturer in mental diseases and examiner in medical jurisprudence at Durham University, but a few years later he moved to Barming Heath, to take the post of assistant medical officer at the Kent asylum. Then he was appointed by the Commissioners in Lunacy to be medical superintendent at the Isle of Man asylum, which post he held until he started consulting practice in London.

His wide experience soon secured an appointment for him at the West End Hospital for Diseases of the Nervous System, as well as at the St. George's and St. James's Dispensary, while he also served on the Boards of Management of the Fenstanton private mental hospital, and at Bailbrook House, Bath. In 1905 he was elected President of the Medico-Psychological Association of Great Britain and Ireland, a due recognition of many years of able and accomplished work, in several sides of which he was an acknowledged authority. He showed this also in his writings, though they were not numerous. He was the author of the article on the "Law and Practice of Lunacy" in Allbutt and Rolleston's System of Medicine, and of the article in Tuke's Dictionary of Psychological Medicine on "Lunacy Law," and he arranged for the use of medical practitioners a résumé of the Lunacy Act of 1889, which was a distinctly serviceable production. Dr. Wood retired from practice 15 years ago, when he elected consulting physician to the West End Hospital and the St. George's and St. James's Dispensary. To his learning and experience he added, as factors in his professional success, the qualities of kindness and sympathy, with the advantage of a fine presence.

He married 60 years ago Caroline Augusta Charlotte, daughter of Mr. Edward Potter, of Cramlington House, Northumberland, who predeceased him and there was no issue.

HUGH MILLER, M.B. Glasg.

BY the death of Dr. Hugh Miller on July 22nd at the age of 54, the Health Department for Scotland has lost a valuable officer. He was appointed by the late Scottish Board of Health as one of the district medical officers under the National Health Insurance Act and he controlled the Dundee district. Such work demands professional skill, experience of practice and aptitude for administration. Dr. Miller had all three. After graduating at Glasgow in 1899, he held a large number of local hospital appointments and studied in Berlin. His work as a general practitioner was done in Gloucestershire and at Hamilton, in Lanarkshire. During the war he held a captain's commission in the Royal Army Medical Corps and for a time was medical officer in charge of the Prisoners of War Hospital at Sidi Bishi. Afterwards he returned to Hamilton and became honorary secretary of the Hamilton local medical and panel committee and deputy chairman of the Scottish committee of the British Medical Association. Appointment as district medical officer followed, and in this capacity his tact and courtesy were happily combined with a high sense of professional duty. His influence was widely felt.

ALTON CRIPPLES' HOSPITAL.—On Founders' Day at Lord Mayor Treloar's Cripples' Hospital and College at Alton it was stated that the 355 beds are constantly in use, that at the college 50 boys are always in training, and that steady development has been made in orthopædic cases, though the majority of the children suffer from tuberculous disease of the bones and joints. Rebuilding, which will cost £100,000, has become imperative; half of this sum has yet to be obtained.

BIRMINGHAM HOSPITAL CENTRE.—The members of the Birmingham Hospital Saturday Fund, an integral part of the contributory scheme, have agreed to pay a levy of an extra penny a week for five years to hasten the completion of the new hospital centre. This five years' levy is estimated to produce over £350,000, and the scheme was strongly supported by the Lord Mayor on the ground that more than 1000 patients are waiting for admission to the two greater Birmingham hospitals.

DONATIONS AND BEQUESTS.—Mrs. Anne Charlotte Harrison, of Watford, who left £205,340, after considerable private bequests, left half of the residue of her estate equally between Watford District Hospital, the Hospital for Sick Children, Great Ormond-street, London, W.C., and the Royal Blind Pension Society of the United Kingdom.—Miss Louisa Susannah Tucker, of Seaton, Devon, among other bequests left £1500 to the Royal Devon and Exeter Hospital, £500 each to the West of England Eye Infirmary, the Sidmouth Cottage Hospital, the Axminster Cottage Hospital, and the Royal Midland Home for Incurables, Leamington; £200 each to the West of England Institution for the Instruction and Employment of the Blind, the National Institute for the Blind, and the Hospital for Sick Children, Great Ormond-street; and £100 each to the Devon and Exeter Dispensary for Sick Animals, the Royal Society for the Prevention of Cruelty to Animals, the Imperial Cancer Research Fund, Dr. Barnado's Homes, and St. Dunstan's Hostel for Blinded Sailors and Soldiers.

CORRESPONDENCE

THE TREATMENT OF PULMONARY TUBERCULOSIS IN SWITZERLAND.

To the Editor of THE LANCET.

SIR,—May I reply to some of the many surprising and misleading statements that appeared in an article "Reflections on the Treatment of Pulmonary Tuberculosis in Switzerland and at Home" by Dr. W. R. E. Harrison in THE LANCET of July 19th.

That Dr. Harrison has been peculiarly unhappy in his experience of Alpine resorts is regrettable, but that he should have published general conclusions from such limited experience is unfortunate. How many of the Swiss sanatoria Dr. Harrison has visited I do not know, but it is clear from his remarks regarding the average hours of sunshine, the number of hours that have to be spent indoors, the coldness of the ice rinks, the ratio of the sporting to the "curing" population, the shut-in character of the country, the impossibility of finding interesting and level walking, the deplorable monotony of the views and by many other remarks, that he would have done better before having embarked on such dogmatic generalisations to have visited a plateau such as is to be found at Montana.

Dr. Harrison confines his generalisations to Swiss sanatoria in Switzerland, but my experience in Montana for the past three years in a British institution have led me to different conclusions.

In Montana during six winter months the *average* hours of sunshine per day according to Sir Leonard Hill were 5·28, which figure is appreciably greater than that of any other "curing" station in Switzerland (Maurer and Billviller in "Das Klima der Schweiz" give as corresponding figures 4·08 for Arosa, 3·83 for Davos, and 3·63 for Leysin), and which greatly exceeds the 2·85 hours for Falmouth and 2·56 for Margate, given by Sir Leonard Hill. Montana is too sunny to rank among the first-class winter sports places and in consequence the great majority of its visitors are patients and their relatives or friends. Dr. Harrison's remark that "the interest and 'life' of these towns is almost entirely bound up with winter sports and the pleasures associated with hotel life" and that they are therefore unsuitable for "curing" does not apply in the case of Montana.

Although he acknowledges the "invigorating effect" of "the dry and sunny climate" and "the improved appearance" of people who have returned from a holiday in Switzerland, he would appear to minimise the importance of the same stimulus on patients. There is no doubt also that sunshine makes a much more pleasurable business of that valuable therapeutic agent, "air bathing." Sir Leonard Hill has supported many clinical observers by proving that the cool dry Alpine air has a very favourable effect on metabolism. (Much of his research was done at Montana.) The Alpine climate also permits of better conditions for "sun bathing" which, carefully supervised, can be used with safety and to the patient's advantage in a certain number of cases of pulmonary tuberculosis. Further, during the greater part of the winter both my "bed" and "up" cases spend as much as from seven to ten (not "five") hours a day outside and then return to rooms which, contrary to Dr. Harrison's experience, are freely ventilated, both day and night.

Since Montana is situate on an extensive plateau with a panoramic view stretching from the distant mountains above the Simplon in the East to Mont Blanc in the South-West, Dr. Harrison's description of the patient in Switzerland living "in a narrow valley" with "jagged mountain peaks crowding all round," likewise does not apply to this resort.

Under the heading "Occupation and Outlook," Dr. Harrison states that all the Swiss sanatoria are inferior to the English ones in their capacity to provide "cheerful health-giving interests," and he attributes this "defect" to "their being situated in the Alpine towns which cater for holiday-makers." Montana, however, as I have pointed out, is primarily a health resort. Both the scenery and the facilities for "outdoor nature study" compare favourably with England, and the climatic conditions are in every way suitable for patients to watch the skating and other sports.

Dr. Harrison tells us that "in Switzerland the prescribed daily exercise is limited to walking," which later he describes as a "dreary tramp." Now exercise in Switzerland must obviously vary according to the season. Walking, of course, is common to all seasons, and as in England is the most important form of exercise, but in winter a few selected cases are allowed to skate. In summer there are excursions in the country, putting, and fishing for those who are considered fit for such diversions. For indoor recreation there are bridge, chess, billiards, clock-golf, and other pastimes suited to the particular and individual need of the patient.

In the paragraph "Spring and Summer," Dr. Harrison makes the statement that "in June the weather may resemble an English February"—in reply to which I will merely point out that the official figure for the *average* daily sunshine for June of this year (by no means a record one) was 8·1 hours.

In conclusion, I feel that the truth regarding the therapeutic value of the Alpine climate lies somewhere between the extreme anti-Swiss feelings of Dr. Harrison on the one hand, and those of the super-Swiss enthusiasts on the other.

I am, Sir, yours faithfully,

HILARY ROCHE, M.D., M.R.C.P., T.D.D.,
Medical Superintendent of Montana Hall, the new British Sanatorium, Montana, Switzerland.

July 22nd, 1930.

To the Editor of THE LANCET.

SIR,—Dr. Harrison's reflections ought to be read by every general practitioner in the British Islands. I enclose the letter of a former assistant who has had a wide experience of home and Swiss sanatoria, and quote from it:—

> "I quite agree with the article by Harrison . . . but I think I could put it a bit stronger. He talks about the monotony of looking at the same patch of snow from a balcony, but what about the people who have to look at the same patch of wall adorned by a mournful picture with a few words of German underneath? When the sun is shining you won't be allowed to have the window open on 'medical' grounds, the real reason being that the sun would fade the floorcloth. When the sun is not shining you won't be allowed to have the window open for fear the water would freeze and burst the pipes, and you are paying 4 guineas a week for the fresh air treatment!"

The above throws a bright sidelight on this Swiss industry. I think it was a strong sense of duty that caused Dr. Harrison to write what amounts to a

summary of what patients and friends have told me for many years. The severe winters are bracing for the strong, but highly dangerous to the weak. There is an absence of home comforts, home interests, home employment. It is difficult often to exercise in the open because of hills and snow, and graded exercise and work are specially difficult to arrange. It must be admitted that our own climate is superior to that of Switzerland in most respects. Dr. Harrison's final sentence is worthy of quotation: "It is a reproach to medical men that so many of these unfortunates should be allowed to die in a foreign land."

I am, Sir, yours faithfully,

R. S. McCLELLAND.

Llwynwern, Dowlais, July 28th, 1930.

THE USUAL VICTIM.

To the Editor of THE LANCET.

SIR,—It has recently been impressed on me that the gentle art of bilking the doctor can be applied with such finesse as to extort a reluctant admiration even from the victim.

Most practitioners of a few years' standing have discovered that among the growing army of the hard-up, the doctor is recognised as the person whose bills can safely be paid last, and who is the easiest to bilk—he is the usual victim. I was not aware until recently, however, how far the latter process can be carried out with the aid of expert backing from the law.

Last summer I undertook the care for a month of a colleague's case while he went on holiday. The patient's family insisted on specialist supervision, and the fees were agreed upon. After a respectable interval I sent in my bill, and as no notice was taken, repeated the process on several occasions. My last two communications were returned marked by the postal authorities "Gone away."

After a period for meditation I placed the matter in the hands of my solicitors. They were informed by the opposing solicitors that trade was in a very bad state, and that their clients could not possibly pay the amount (although they had been able to reside for the season in an expensive part of London). Encouraging my solicitors to persevere, they were successful in obtaining £10 on account. There was a lull after this for a time, and then hostilities recommenced on a grand scale by the taking out of a writ in the High Court of Justice by my solicitors for payment of the balance. The enemy countered by paying into Court the amount of the debt *less one-third* of the original total. That was a polite intimation that they challenged the amount of the fees. I was then left with the alternative of accepting the reduced amount or proving my case in Court—that the fees were reasonable, &c., which would have required the appearance of medical witnesses to speak of my standing, professional ability, and so on.

The technique was described by my solicitors' clerk as a "dirty trick," but is evidently quite legitimate in the eyes of the law. I may mention, in conclusion, that my colleague's bill was considerably larger than mine, and as he is a Fellow of the Royal College of Physicians, his chances of recovering his fees are somewhat tenuous. We may depend upon it that such experts in the gentle art are aware of the College's prohibition.

I am, Sir, yours faithfully,

FREDERICK DILLON, M.D.

Wimpole-street, W., July 22nd, 1930.

HYPOGLYCÆMIA AND SUPRARENAL TUMOUR.

To the Editor of THE LANCET.

SIR,—Your annotation on this subject (July 26th, p. 200) prompts me to say that quite recently I saw a case of Addison's disease with cerebral seizures remarkably like those due to overdosage with insulin, which I attributed to hypoglycæmia. I then came across a paper by G. Maranon (*Presse Méd.*, 1929, xxxvii, 1021), recording a low blood-sugar in 71 per cent. of his cases of Addison's disease, in which acidosis was also frequent. Cerebral seizures occurred in a number of the cases. He, too, attributes a large part, but not the whole of this to hypoglycæmia. It is interesting in view of the failure of intravenous injections of glucose to benefit the case described in your annotation, that Maranon found this procedure positively dangerous, producing a febrile reaction with serious collapse, and even death. Glucose by the mouth in doses of 25 g., three or four times a day, on the other hand, was distinctly helpful. The reason for this difference is not clear, but it is important to bear it in mind in the treatment of the hypoglycæmia of Addison's disease.

I might add, as you mention the occurrence of hypoglycæmia in necrosis of the liver, that Maranon has shown the existence of hepatic insufficiency in Addison's disease, and that I have seen striking improvement follow the administration of liver extract in this condition.

I am, Sir, yours faithfully,

W. LANGDON BROWN.

Cavendish-square, W., July 26th, 1930.

CONGENITAL ATRESIA OF THE ŒSOPHAGUS.

To the Editor of THE LANCET.

SIR,—I have lately had under observation a case resembling the one described by Dr. Polson in your issue of July 19th (p. 135).

A female child, a few hours old, was admitted to the Queen's Hospital for Children, Hackney-road, on July 16th, under the care of Dr. Helen Mackay. It was born at full term after an easy labour lasting two hours, weighed 8 lb., and appeared to be a strong healthy infant. On attempting to feed the child it became cyanosed and vomited. On admission to hospital it was dyspnœic, and was vomiting mucus; there was marked retraction of the intercostal spaces. The air passages were cleared as much as possible with a mucus catheter, and the general condition improved. The child became cyanosed and vomited whenever attempts were made to feed it. A radiogram showed an œsophageal pouch.

At autopsy atresia of the œsophagus was found at the level of the upper border of the sternum. The upper segment was dilated to form a sac, the lower was narrowed to form a cord, and was not patent. There was an opening ¼ in. in diameter in the trachea at the level of the bifurcation connecting with the lower segment of the œsophagus. There was complete absence of the septum ventriculorum, but no other congenital abnormality was found.

I am, Sir, yours faithfully,

C. B. SMITH, M.R.C.S.

Queen's Hospital for Children, London, E., July 23rd, 1930.

EOSINOPHILIA IN ASTHMA.

To the Editor of THE LANCET.

SIR,—In a report of the scientific meeting of the Asthma Research Council (THE LANCET, 1930, i., 1293) Dr. Marjorie Gillespie, in describing the eosinophil count in asthma, stated that the highest

ecorded was 57 per cent. A case of asthma submitted to this laboratory for blood examination howed the following percentage of eosinophils.

May	2nd, 18	per cent.	..	Total white count,	20,400.
„	12th, 15	„	..	„	„	„	16,400.
June	2nd, 73	„	..	„	„	„	20,100.
„	6th, 78	„	..	„	„	„	Not done.
„	16th, 71·5	„	..	„	„	„	„
„	30th, 63·5	„	..	„	„	„	„

The possibility of helminth infestation adding to he eosinophilia was excluded by fæces examinations n three occasions. Eosinophilia were also present n the sputum. The patient was having attacks of asthma at irregular intervals, but the blood counts were not done during the attack.

I am, Sir, yours faithfully,

A. HOOD, M.B.,

Major, R.A.M.C., Assistant Director of Pathology, Southern Command.

Poona, India, July 7th, 1930.

CYCLICAL VOMITING.

To the Editor of THE LANCET.

SIR,—The writer of your annotation (July 26th, p. 201) emphasises the constancy with which hypoglycæmia is associated with attacks of this disorder. This has not been my experience. On the contrary, between attacks the blood-sugar is invariably normal, and it does not fall until the attack is well advanced and vomiting has been present for some time, and not always then. Hypoglycæmia in children does not commonly precede or initiate an attack of cyclical vomiting, probably because the glycogen reserves of the liver are never entirely exhausted. The blood-sugar may fall, of course, to a very low level after long-continued vomiting or other causes of starvation. Also there does not seem to be any evidence that hypoglycæmia occurs more frequently in "nervous" than in other children. The beneficial action of sugar in debilitated children would seem to be due to increasing the glycogen reserves, not the concentration of sugar in the blood. The evidence for these statements has been set forth in a recent paper by Dr. H. G. Close and myself in the *Archives of Disease in Childhood*, 1930, v., 149.

I am, Sir, yours faithfully,

London, W., July 28th, 1930. A. ARNOLD OSMAN.

A GENERAL MEDICAL SERVICE.

To the Editor of THE LANCET.

SIR,—I find the leading article with this title in your pages last week a generous appreciation. There are many points in the scheme of the B.M.A. for a general medical service on which further comment might be forthcoming both *pro* and *con*; but I only wish to call attention to the fact that there is here propounded a system of service, and not one of those petty and partial local schemes that have been too often current in conversation. The scheme is one among other indications that at last the medical profession in all its divisions and subdivisions is a primary organ in maintaining a reasonably efficient social organisation. Now that the medical profession sees itself as a vast social instrument, the lay mind should be a little less patronising—less anxious to "keep the doctor in his place" as a mere adviser.

I am, Sir, yours faithfully,

July 30th, 1930. W. LESLIE MACKENZIE.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.

To the Editor of THE LANCET.

SIR,—I observe in your issue of to-day you state that last year 354 in-patients were admitted to this hospital, and that this number exceeded all previous totals. The fact is that 2055 in-patients were treated last year; the number of out-patients treated was 9253, and the number of out-patient attendances was 103,254. These figures exceed all previous totals, and do not include the patients treated at the various local clinics. There are now 470 beds in this hospital, including its country branch at Stanmore. I shall be grateful if you will correct the misapprehension which is likely to arise from the figures you publish this week.

I am, Sir, yours faithfully,

ARTHUR MORLEY,
Secretary.

Royal National Orthopædic Hospital, July 26th, 1930.

*** We regret the misprint.—ED. L.

THE TRANSFER OF APPOINTMENTS WITH THE PRACTICE.

To the Editor of THE LANCET.

SIR,—Doctors who may find it necessary to sell their practices owing to ill-health will be well advised to give some little attention to this letter, in connexion with the transfer of appointments recently under the Boards of Guardians. Without arguing the morality or justice of appointments being sold with the rest of a practice, the fact remains that in the past this custom has been usual in the vast majority of cases unless the purchaser has been quite an impossible man, and because as a gesture of loyalty and sympathy to a colleague whose health has broken down, the other doctors in the district have refrained even from applying for such posts.

Things would appear to have changed, in that I have recently been compelled to sell my practice owing to a breakdown in health, and the purchaser has not succeeded to the appointments I held under the Board of Guardians, in spite of the fact that he was officially appointed my deputy when I was granted a month's sick leave and that no complaints were made as to the zeal and efficiency he showed.

My own troubles at the moment are confined to the loss of £500 which I can ill afford, and are as nothing compared to the tragedy that has befallen the purchaser who had saved enough money as an assistant to pay a certain sum down and the rest by instalments, under the impression that he was buying an income that has supported a doctor and his family for 40 or 50 years. He now finds his income cut down by about two-fifths, and how he is going to live and pay off the balance of the purchase money I really don't know, because there can't be any scope for increase in a district that is already over-doctored and is suffering acutely from the competition of State medical services.

I am asking you to be good enough not to disclose my name and address for very obvious reasons, but I enclose my card.

I am, Sir, yours faithfully,

July 18th, 1930. DISAPPOINTED OPTIMIST.

PS.—And it is to be remembered that the State more or less agrees to the sale of a couple of thousand human bodies in the sale of panel practices, and I'm not sure that the State does not actually pay the cost of the notices sent out in such cases!

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

BILLS ADVANCED.

IN the House of Lords on Thursday, July 24th, the Adoption of Children (Scotland) and the Education (Scotland) Bills were read a second time. On Friday, July 25th, the Housing (No. 2) Bill was agreed to on Report.

On July 28th, in the House of Lords, the Housing (No. 2) Bill was read the third time and passed. The Education (Scotland) Bill and the Adoption of Children (Scotland) Bill passed through their remaining stages, and were read the third time and passed. On July 29th, in the House of Lords, the Housing (Scotland) Bill was read the third time and passed.

HOUSE OF LORDS.

WEDNESDAY, JULY 23RD.

Royal Veterinary College.

The Earl of HAREWOOD asked the Government if they had investigated the position of the Royal Veterinary College, and what steps they were prepared to take to maintain it; and moved for papers. He said that the College had reached a stage in its career when some action must be taken promptly or the Governors would have to take a step which would eventually lead to the closing of the College—namely, the refusal to accept new students. At present the expenditure of the College exceeded the income, and the buildings were in an irreparable state. During the past three years the Governors had raised £30,000 towards the building fund. The departmental committee which reported last year recommended that the freehold of the site at Camden Town should be purchased for £20,000; secondly, that £280,000 should be spent on erecting new buildings; and, thirdly, that £25,000 should be spent outside London for the purpose of providing a research laboratory affiliated with the College. The committee also recommended that the annual income of the College should be guaranteed at not less than £21,000. He had received a letter from Lord de la Warr stating that the conclusions of the Government—which he hoped were not fixed—were that the sum of £20,000 for the purchase of the freehold should be cancelled while extensive buildings should be erected on the leasehold site at a cost of £250,000 instead of £280,000, which the departmental committee considered was the absolute minimum. He (Lord Harewood) was very doubtful whether £250,000 would be sufficient for the purpose, but the Governors would be willing to consider the Government's offer on that point if they saw any reasonable prospect of securing £250,000 with which to build. The Government's offer was to give pound for pound for the £30,000 which the Governors had in hand, and provide £70,000 in addition. That made £130,000, and the Government added that when the sum collected by the Governors reached £200,000 they would be prepared to recommend to Parliament a further grant of £50,000. From what he knew of the condition of agriculture he scarcely thought that there was the slightest hope of getting that £70,000, and so sure did the chairman of the Governors and the treasurer feel on that point that they informed him that morning that at a meeting of the Governors next week they would recommend that the Governors should refuse the whole of the offer of the Government, because there was no hope of raising a sufficient sum to rebuild the College. They would have to refuse to admit further students into the College. but the actual closing of the College would take about four years, because the Governors were so far committed to the students already there not to close the College before their course of instruction had been definitely completed.

Lord ERNLE said it was a disgrace to the country that this College should be allowed to lapse into extinction. In Berlin the annual sum paid for veterinary science was £280,000, while here it was only £16,000. The College had a chance of becoming affiliated as one of the schools of the University of London, but the University could not be expected to accept a College whose buildings were hopelessly inadequate and whose finances were practically insolvent. Veterinary science was mixed up with the department of public health, and the progress of human pathology and animal pathology had gone hand in hand, as Pasteur and Koch had illustrated.

Earl DE LA WARR (Parliamentary Secretary to the Ministry of Agriculture) said that the offer which the Government made last August to the Governors of the College was that they would give pound for pound up to £100,000. The Governors felt that whether that was a reasonable offer or not, they would not be able to collect sufficient money to make up the sum of £280,000. He took it that what the noble lord would like would be that His Majesty's Government should take over the College completely, rebuild it at the expense of the State, and provide virtually all the maintenance expenses. That would be an entirely new principle in the relations of the State with what amounted to a University department. Hitherto the policy had been that education of university rank should be aided by Government grant, but that the Government did not take the responsibility of maintenance, which was primarily a matter for the governing body. The Government could not accept the view that the entire responsibility for veterinary education should ultimately fall upon the State; but in view of the special circumstances associated with the College the Government had gone up to an offer of 30*s*. per £1 raised. He suggested that the Governors should make an effort to raise the money required, and if they did so they would have all the assistance and encouragement that the Ministry of Agriculture and His Majesty's Government could give them.

After further appeals had been made to the Government by Lord PHILLIMORE, Earl BATHURST, Viscount BRENTFORD, and Lord DANESFORT to save the College,

Earl DE LA WARR said that he could not hold out any hope that the Government would reconsider their decision; but he suggested that Lord Harewood and his friends might have a conference with the Ministry of Agriculture before coming to a decision as to the future of the College.

The Earl of HAREWOOD said that he would see the chairman of the Governors and the treasurer and try to persuade them to take in, at any rate, one further lot of young students if he could hold out any hope that the Government would see them through the absolute expenses necessary for carrying on the course for the next year or two. He withdrew his motion for papers.

HOUSE OF COMMONS.

WEDNESDAY, JULY 23RD.

Naval Stokers and Tuberculosis.

Mr. MARKHAM asked the First Lord of the Admiralty if, in view of the number of stokers invalided yearly out of the service with tuberculosis, he would set up a departmental committee to investigate the cause.—Mr. ALEXANDER replied: The question of tuberculosis in the Services was examined in 1928 by a joint medical services committee, and no useful purpose would be served by appointing a further committee. Methods of combating the disease are constantly under consideration. I may add that the incidence of tuberculosis among this branch of the engine room ratings is not considered to compare unfavourably with the incidence

n the Navy as a whole or with that of the urban civil opulation of England and Wales.

THURSDAY, JULY 24TH.

Accidents to Shop Assistants.

Mr. HOFFMAN asked the Home Secretary what steps he roposed to take, in view of the increasing number of acci- ents which occur, to protect from injury shop assistants mployed in shops where bacon-cutting and other meat- utting, sausage-making, coffee-roasting, and grinding achinery was in use to secure that first-aid outfits were vailable.—Mr. CLYNES replied: I have no statutory owers to intervene except in cases where the part of the remises in which the work is carried on constitutes a actory, but the position has been discussed with the National ederation of Meat Traders, who fully recognise the need for afeguards for meat-cutting and sausage-making machines, nd have taken the matter up with their members on everal occasions. In a few cases where the Factory Act pplies the provisions of the Factory Act relating to fencing nd first-aid have been applied. I am not aware of accidents om the other classes of machine mentioned, but if my on. friend can furnish me with information I shall be lad to look further into the matter.

Artificial Sun-ray Treatment.

Mr. DAY asked the Minister of Health the number of entres approved by his department for the purpose of rtificial sun-ray treatment; and how many applications ad been made to his department by local authorities uring the previous 12 months for the approval of similar entres.—Mr. GREENWOOD replied: 265 such centres had een approved by my department up to April 1st last. uring the previous 12 months 14 applications were eceived from local authorities for approval of similar entres.

Slum Clearance Schemes.

Mr. DAY asked the Minister of Health the number of uildings acquired and demolished for slum clearance hemes since April 1st, 1925; how many new dwellings ad been erected in connexion with slum clearance schemes er the same period; if he could give an approximate timate of the number of persons rehoused in new dwell- gs, and any statistics of the number of persons still living slum habitations.—Mr. GREENWOOD replied: The umber of buildings acquired by local authorities in England nd Wales since April 1st, 1925, in connexion with approved um clearance schemes is approximately 10,700, and the umber demolished approximately 9000. The number of ew dwellings erected since the same date in connexion ith such schemes is rather more than 9700, and it is stimated that some 48,000 persons occupy these new wellings. Statistics on the point raised in the last part f the question are not available.

MONDAY, JULY 28TH.

India and British Medical Supplies.

Mr. GRAHAM WHITE asked the Secretary of State for India he had any evidence as to the effect of the recent decision f the General Medical Council with regard to the rights of ndian medical graduates upon the volume of British trade ith India in medicines and medical appliances.—Mr. EDGWOOD BENN replied: I have no statistics of this trade recent months. I was informed in April last that a oycott of these classes of British goods had been established consequence of the decision of the General Medical ouncil, but in May I heard that this boycott was weakening, nd that orders for British goods were being placed. I have eceived no later reports.

TUESDAY, JULY 29TH.

Poison Gas Experiments with Animals.

Mr. FREEMAN asked the Secretary of State for War what vidence he had, and how it was obtained since 1918, that xperiments conducted at Porton and elsewhere of poison ases on living animals showed that these gases had the same ffects on human beings.—Mr. SANDERS (Financial Secretary o the War Office) replied: My right hon. friend is definitely dvised by his expert advisers that the results of the xperiments are such as to leave no doubt that the methods f curative treatment of the effects of gas which those xperiments suggest are applicable to human beings.

Supply of Medical Officers in the Services.

Dr. VERNON DAVIES asked the Under Secretary of State or Air if the supply of medical officers for that Service was atisfactory; and if any difficulty was experienced in ecruiting officers for the service.—Mr. MONTAGUE replied: here is still some difficulty in obtaining the numbers of edical officers required. The question is one which is constantly engaging the attention of the medical authorities at the Air Ministry and of the Air Council.

Dr. VERNON DAVIES asked the Secretary of State for War the present position with regard to medical officers in the Army; if there were any signs of more satisfactory recruitment to this service; and the reasons for the present position.—Mr. SANDERS replied: The present shortage of regular Royal Army Medical Corps officers is approximately 140, and my right hon. friend is in consultation with the Army Medical Advisory Board as to the causes of this shortage and the possible remedies.

Dr. VERNON DAVIES asked the First Lord of the Admiralty what was the present position with regard to medical officers in the Navy; if there were any signs of more satisfactory recruitment to this service; and, if not, the reason for the present position.—Mr. AMMON (Parliamentary Secretary to the Admiralty) replied: I regret that the shortage of Naval medical officers still continues, and that there are no signs of more satisfactory recruitment. The question is under consideration by the Admiralty.

Infantile Paralysis in Scotland.

Mr. MARCUS asked the Secretary of State for Scotland the number of children under the age of 7 years who died of infantile paralysis during the year 1929; and whether, seeing that the high infantile mortality was largely due to the drinking of impure milk, what steps he proposed to take to ensure a pure milk-supply.—Mr. JOHNSTON replied: During the year 1929, nine children under the age of 7 years died of infantile paralysis in Scotland. As regards the second part of the question, my right hon. friend is advised that the high death-rate among infants is due in the main to causes that cannot be attributed to impure milk. He fully recognises, however, how important a pure milk-supply is to the health of children and of the community generally, and I can assure my hon. friend that the matter is one which is receiving the close attention of the Departments concerned. I am sending him a copy of a circular that the Department of Health for Scotland issued recently on this and other aspects of food administration.

Treatment for Functional Nervous Disorders.

Mr. MANDER asked the Minister of Health if he was aware that, owing to the shortage of accommodation and treatment for persons suffering from functional nervous disorders, a large number of persons would have to be admitted to asylums and become chargeable to the State; and what action he proposed to take.—Mr. GREENWOOD replied: I am unable to agree that the shortage of the facilities to which the hon. Member refers is such as to result in the admission of a large number of persons to mental hospitals. I have already explained to the hon. Member that under the Mental Treatment Act local authorities (with whom, and not with the State, rests the financial responsibility for these patients), are given extensive powers to provide for the preventive treatment of incipient mental illness. The position under the Act has been fully explored in a two-days' conference with Visiting Committees, and I do not think that any further action could usefully be taken at present.

In the résumé of the debate in Committee of Supply on the vote for Health Administration in Scotland we regret that, through a mechanical error, the valuable contribution from Sir Robert Hamilton became attributed, mostly, to Sir John Gilmour.

A LEICESTER CHILDREN'S CONVALESCENT HOME.—On Monday last the first patients were admitted to the Roecliffe Manor Convalescent Home, near Leicester, which has been bought and adapted by the Leicester and County Hospital Saturday Society. It contains 50 beds for boys and girls between 3 and 14 years. Since its foundation in 1903 the society has raised £633,000, of which Leicester Infirmary has received £402,000; the remainder has been spent on convalescent treatment.

MANCHESTER TUBERCULOSIS DISPENSARY.—Judgment was given on July 22nd by Mr. Justice Maughan in the Chancery Division in the action of the proprietor of the Rivoli Cinema against the Manchester Corporation that the corporation had no power to build a tuberculosis dispensary on a site opposite the infirmary and bounded by Oxford-road, Denmark-road, and Aberdeen-street. It had been an open space for many years. The corporation had previously obtained the approval of the Ministry of Health to the building of the dispensary. His lordship held that no public right of way had been acquired over the land, and held that the approval of the Ministry of Health had given the corporation authority to use the land for the purpose which had been approved.

MEDICAL NEWS

University of London.

At recent examinations the following candidates were successful:—

M.D.

Branch I, Medicine.—R. G. Anderson, St. Bart.'s Hosp; J. R. Blazé, Ceylon Med. Coll. and Univ. Coll. Hosp.; P. E. J. Cutting, St. Bart.'s Hosp.; Hari Das, Univ. Coll. Hosp.; T. A. Davies (University Medal), St. Thomas's Hosp.; R. E. Ford, London Hosp.; L. W. Hale, Univ. Coll. Hosp.; S. W. Hardwick, St. Bart.'s Hosp.; J. C. Hawksley, Univ. Coll. Hosp.; E. G. Housden, St. Thomas's Hosp.; C. A. Keele, Middlesex Hosp.; C. W. Marshall, Guy's Hosp.; S. P. Meadows, Univ. of Liverpool and St. Thomas's Hosp.; A. J. Morland, Univ. Coll. Hosp. and Univ. of Lausanne; R. H. Morley, Univ. of Leeds; Thomas Morton, St. Thomas's Hosp.; A. M. Richards, Univ. Coll. Hosp.; Gwladys V. Smallpeice, London (R.F.H.) Sch. of Med. for Women; Emrys Williams, St. Thomas's Hosp.; and William Yeoman, Univ. Coll. Hosp.

Branch II, Pathology.—K. T. Gajjar, Univ. Coll. Hosp.; and Dorothy S. Russell (University Medal), London Hosp.

Branch IV, Midwifery and Diseases of Women.—W. M. Brown, Guy's Hosp.; Elizabeth J. Carpenter, London (R.F.H.) Sch. of Med. for Women; G. M. FitzGibbon, St. Thomas's Hosp.; E. E. D. Gray and E. H. Roche, Guy's Hosp.; Iris V. I. Ward, London (R.F.H.) Sch. of Med. for Women; and Jane C. Williams, St. Mary's Hosp.

Branch VI, Tropical Medicine.—Frank Marsh, Guy's Hosp.

M.S.

Branch I, Surgery.—A. E. de Chazal, Univ. Coll. Hosp.; K. W. Heritage, London Hosp.; and Ivor Lewis, Univ. Coll. Hosp.

University of Edinburgh.

At a graduation ceremonial on July 23rd the following degrees were conferred:—

M.D.—J. R. Dogra,**† R. O. Eaton,* W. C. Fothergill,† J. S. Fulton,*** Anne Gibson, O. K. G. Guyer, C. I. Irvine-Jones, J. P. S. Jamieson, John Lowe, J. E. Maccabe, A. A. S. M'Donald, Bessie R. Mackenzie, F. G. Macnair, J. C. Moir,*** David Pottinger,† A. L. K. Rankin,* F. E. Reynolds,*** J. B. Rolt, D. R. Thapar, Mary Turton (*née* Martin), William Waddell, and H. E. Y. White.

Ch.M.—A. S. Fry.

The degrees of M.B. and Ch.B. were conferred on the candidates whose names were given on p. 221 of THE LANCET last week (with the exception of W. R. de Faria) and on Margaret L. Mackay. The following diplomas were also granted:—

Diploma in Psychiatry.—W. J. Raitt.†

Diploma in Radiology.—J. S. Fulton, Y. N. Krishnamoorty,† S. K. Montgomery,† K. R. Speeding,† J. C. Tainsh, and A. G. C. Taylor.†

*** Gold Medal for Thesis. ** Highly commended for Thesis. * Commended for Thesis. † In absentia.

The Cameron Prize in practical therapeutics has been awarded to Dr. George Richards Minot and Dr. William Parry Murphy "in recognition of their discovery of the treatment of pernicious anæmia by the administration of liver."

University of Manchester.

Mr. J. P. Buckley has been appointed lecturer in surgical pathology; Mr. Harry Platt and Mr. D. McKay Sutherland lecturers in applied anatomy; and Mr. A. Graham Bryce lecturer in regional surgery.

Dr. F. H. Lacey, Mr. D. P. Sutherland, and Dr. William Susman have been appointed members of the Board of the Faculty of Medicine.

University of Sydney.

The Senate has announced that the Rockefeller Foundation has decided to contribute £100,000 to provide laboratory facilities for the departments of medicine, surgery, pathology, and bacteriology. The recent establishment of full-time Bosch chairs in medicine, surgery, and bacteriology has brought the medical school of the University within the scope of the activities of the Foundation. It is the intention of the university to build a new block close to the Royal Prince Alfred Hospital. The present medical school will continue to house the departments of anatomy, physiology, pharmacy, and dentistry. The new block will take in the departments of medicine, surgery, pathology, and bacteriology as well as departments which have already been endowed. An account of the new school of Public Health and Tropical Medicine at Sydney lately appeared in THE LANCET (1930, i., 1195).

Society of Medical Officers of Health.

The annual Neech prize for the best paper read before branch or group of this society has been awarded for th session 1928–29 to Dr. J. Sim Wallace for his address o the Prevention of Dental Caries, published in *Public Healt* in February, 1929. The award has been delayed to allo publication of all the papers submitted for consideratio by the assessors.

Fellowship of Medicine and Post-Graduate Medica Association.

From August 5th to 30th an afternoon and evening course consisting of clinical and cystoscopic demonstrations, wi be given at the All Saints' Hospital, Vauxhall Bridge-roa Demonstrations will be given on both male and femal patients. Particulars of operations may be had from th hospital. An all-day course in Diseases of the Chest wi be held at the Brompton Hospital from August 11th to 16th In September there will be a course in Diseases of Childre at the Queen's Hospital from the 1st to the 13th, and on in Medicine, Surgery, and the Specialties at the Wes minster Hospital from the 15th to the 27th. Copies of a syllabuses and a programme for the winter months ma be had from the secretary of the Fellowship at 1, Wimpol street, London, W. 1. A provisional list of special cours for 1931 is now available.

Founder's Day at Epsom College.

On July 26th Lord Burnham presented prizes to 7 successful boys and happily refrained from offering to th rest the usual consolatory phrases. His eloquent speec was largely in praise of Lord Rosebery, his predecessor, president of the school, and in appreciation of the achiev ments and ideals of Epsom College. The headmaster, M A. Powell, reported a gratifying series of academic an athletic successes among past and present Epsomians, an announced the decision of the Council to proceed with th building of a new sanatorium which is to cost £25,000 an to be a model of its kind. The existing sanatorium will be co verted into a house for 40 boys, bringing the total accon modation up to 450. Dr. Raymond Crawfurd, as chairma of the Council, thanked Lord Burnham for coming, an gave an account of distinguished holders of the office president since the College was founded in 1853. Th entertainments offered to parents and guests included th annual cricket match against a team of Old Epsomians, a assault-at-arms, and in the evening a spirited performan of "The Gondoliers" by the school choral society.

A Military Medical Museum.

On July 26th, at the Duke of York's Headquarter Chelsea, Lieut.-General H. B. Fawcus, Director-Gener of Medical Services, opened a museum which has bee instituted by the officers of the 47th Division, R.A.M.C (T.A.), for the purpose of instructing the men in anatom physiology, hygiene, field sanitation, first-aid, and arm nursing. General Fawcus and Mrs. Fawcus were receive by the A.D.M.S., Lieut.-Colonel L. D. Bailey, and after a inspection of the guard of honour provided by the R.A.M.C units of the Division the General was presented with key with which he formally opened the museum. Gener Fawcus said that the officers of the Division had bee endeavouring to attract a better type of man into the rank and had realised that in so doing they must provide for hi an intellectual interest and a means of learning his wo thoroughly and intelligently. He expressed great appr ciation of the work already done in connexion with th establishment of the museum, the collection of specimen models, and diagrams, and observed that the officers of th Division were evidently not men who let grass grow und their feet. He congratulated them on their activitie and foresaw for the museum a wide and ever-increasin usefulness. Colonel Bailey thanked General Fawcus f coming to open the museum; it was one more proof of th interest he had always shown in the activities of the Ter torials. The museum was in its infancy, but already ver precious to the R.A.M.C. units of the 47th. He thanke the Territorial Association for bearing the expense decorating the room, and numerous donors for the gifts furniture, specimens, models, and the like. He announce that regular weekly lectures would be given in the museu by experts in the various subjects relevant to the R.A.M.C training. Captain H. A. C. Gregory seconded the vote thanks.

London School of Hygiene and Tropical Medicine.

Every second year, in memory of the late Dr. Cowas Lalcaca, a silver medal is awarded to a student of this school for the best essay on clinical medicine and surgery in the tropics. The competition is open to any student who has obtained the school certificate. The next award will be made in the autumn of 1931.

"Hospital Ballots."

Under this title the Hospitals Automatic Ballot Association, Ltd., is inaugurating a system of competitions in aid of hospital funds by means of automatic machines. By placing a shilling in the machine an entry form for a competition, "simple tests of skill and judgment," will be delivered. Prizes amounting to £2000 will be given in each competition, the first of which will be in aid of the reconstruction fund of St. Bartholomew's Hospital. It is calculated that the expenses, including the rent of sites for the machines, will be 20 per cent. of the receipts, and after deducting from the remaining 80 per cent. the cost of the prizes and small expenses connected with them, the balance will be distributed to the hospitals. It is stated that 1000 automatic machines are at once to be distributed in and around London and the south-east of England; some are already in position. The trustees of the scheme are Field-Marshal Sir Claude Jacob, Sir Gordon Campbell, and Sir D'Arcy Power, and the judges of the competitions are Sir Francis Goodenough, Mr. Edgar Wallace, and Mr. Gilbert Frankau.

Reunion of War-blinded Masseurs.

Under the auspices of St. Dunstan's the annual luncheon and reunion of blinded soldier masseurs was held at the Langham Hotel, London, on July 25th. Captain Ian Fraser presided over a gathering which included nearly 70 masseurs and numerous representatives of the medical profession and public bodies. The chairman said that the Prince of Wales had heard with very great pleasure of the success attained by more than 100 blinded soldiers who had been trained as masseurs and medical electricians. The primary object of the luncheon was to do honour to the masseurs, who were an outstanding example of the success which St. Dunstan's men had achieved. The secondary purpose was to give an opportunity of referring to the medical profession in general. The St. Dunstan's family consisted of some 2000 men and 5000 wives and children, and the health of this large group had become a big responsibility. He wished to place on record their appreciation of the services of the medical profession and hospitals throughout the country. Nearly 2000 men had been blinded in the late war. Sir Arnold Lawson and Major A. W. Ormond had compiled statistics showing that in 41 per cent. of the cases blindness was due to wounds from high explosives or bombs, in 29 per cent. to bullet wounds, and 27 per cent. to non-traumatic causes, such as detachment of the retina, cataract, and optic atrophy, and the aggravation of conditions which might have been latent but for war service. Up and down the country these men required the help of the medical profession, and it was given generously.—Sir Thomas Horder, proposing the toast of Our Patients, spoke of his interest in physical therapy—"a series of ancillary methods of treating patients which begins with the human hand." It was common knowledge that the blind had a peculiar facility for massage. Some people were visualists, others were auditives, and he had no doubt that some were primarily tactualists. The blind in his audience were obviously auditive, but they were making themselves effective and skilled tactualists. In physical therapy he preferred simple to complex methods, but patients were impressed by machinery and there was a danger that the human hand would be put in the background. An enormous field lay open for progress in massage and manipulation. At the present time he thought there was, perhaps, too great a tendency to substitute so-called passive movement for active movement. No amount of massage or electrical stimulation had the same physiological value as a natural movement carried out by the patient under supervision and careful guidance. The moral effect of the masseur's work was tremendous, and his health and personality had a definite value apart from the treatment he gave with his hands. Coöperation with the doctor was essential, and in case of doubt about the value of treatment it was the masseur's duty to give his views to the medical man in charge of the case.—Mr. Edmund Toft, in proposing Sir Thomas's health, said that the masseurs' ambition was to prove themselves as worthy in the war against disease as in the war in which they lost their sight. They were dependent on the profession for the success of their work.—Sir Neville Pearson gave the toast of The Guests, coupled with the name of Mr. R. C. Elmslie, F.R.C.S., chairman of the Chartered Society of Medical Massage and Gymnastics, who responded.

Municipal Grant to Voluntary Hospital.

East Ham town council has decided to make a grant of £3000 per annum to East Ham Memorial Hospital on condition that certain services are provided and that the council has five representatives on the management committee and a medical representative on the medical committee.

Enlargement of London Temperance Hospital.

This institution in Hampstead-road, N.W., is being enlarged. A new wing is to be built for the pathological, electrical, massage, and sunlight departments, with additional accommodation for the nursing staff and private patients. This work has been made possible by the children, grandchildren, and great-grandchildren of the late Mr. and Mrs. Samuel Insull, who took an active part in the work of the hospital in its early days. The new building is consequently to be called the "Insull Memorial Extension."

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 4th, to SATURDAY, August 9th.—ALL SAINTS' HOSPITAL, Vauxhall Bridge-road, S.W., Afternoon and Evening Course of Clinical and Cystoscopic Demonstrations (Male and Female). Four weeks. Further particulars from the Fellowship of Medicine.

Appointments

BROWN, C. M., M.B., Ch.B. Glasg., has been appointed Tuberculosis Medical Officer for Hull.

FRASER, A. MACK., M.D., Ch.B. Aberd., D.P.H., Medical Officer of Health, Inverness.

MURPHY, J. C., L.R.C.P.I., L.R.C.S.I., Medical Officer, Terryglass Dispensary District, Tipperary.

SKENE, G. W. R., M.D., Ch.B. Edin., Vice-Chairman of the Willesden Hospital Council.

King's College Hospital: J. G. Y. BELL, M.B., F.R.C.S., Junior Urological Surgeon; F. GOLDBY, M.B., M.R.C.P., Assistant Pathologist.

Certifying Surgeons under the Factory and Workshop Acts: ANDREWS, H. A., L.R.C.P. Lond., M.R.C.S. (Tonbridge); MCLEISH, H., M.B., Ch.B. St. And. (Cupar, Fife).

Births, Marriages, and Deaths

BIRTHS.

FILMER.—On July 18th, at Wilbraham-place, S.W., the wife of Harold E. Filmer, M.R.C.S., L.R.C.P., of a daughter.

PENRY.—On July 13th, at Priory Dene, 33, West Cliff-road, Bournemouth, to Frances Phelps Penry, wife of John Penry, M.R.C.S., L.R.C.P.—a daughter.

MARRIAGES.

MCCAHON—WHIGHT.—On July 24th, at St. Olave's Woodberry Down, Albert Edward McCahon, M.B., Ch.B., of Stoke Newington (late of Kilrea, Ulster), to Kathleen, only daughter of Mr. and Mrs. Arthur Whight, of Allerton-road, Lordship Park.

PUDDY—BARBER.—On July 22nd, at Easthampstead Parish Church, Eric Ivimy Puddy, M.B., B.S., to Patience Elizabeth Barber, daughter of the late Percy Barber, of Charlton Court, Tetbury, Glos., and of Mrs. Lawrence Mitchell, of Bracknell, Berks.

DEATHS.

MASON.—On July 25th, at Portland-court, W., J. Wallis B. Mason, M.D., late of Osnaburgh-terrace, N.W., in his 77th year.

MASSON.—On July 27th, as the result of a motor accident, John Masson, M.D., aged 71.

MILLER.—At Ravelston-place, Edinburgh, Hugh Miller, M.B., Ch.B., Regional Medical Officer, Dundee, of Daylesford, Newport, Fife, late of Hamilton and Stow-on-the-Wold.

NIALL.—On July 23rd, Eugene Michael Niall, M.D., of Arlington-street, Piccadilly, S.W.

O'SULLIVAN.—On July 17th, at Kinsale, Ireland, Danie O'Sullivan, M.R.C.S., L.R.C.P., aged 60.

SOLTAU.—On July 26th, in London, Alfred Bertram Soltau, C.M.G., C.B.E., F.R.C.S., F.R.C.P., M.B., M.D., of Plymouth, in his 55th year.

WELLS.—On July 25th, at Castle Hill Lodge, Maidenhead, Charles Wells, M.D., after long illness, aged 81 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

DISTRIBUTION OF BLOOD GROUPS IN SOUTH AMERICAN INDIANS.

By GERALD GOLDEN, M.B. LOND.

L. and H. Hirszfeld [1] were the first to draw attention to the possible ethnological significance of the distribution of blood groups. They made numerous observations during the war among the many different nationalities represented in the Macedonian campaign. They found that the populations of Western Europe are characterised by a high proportion of groups II. and IV. (Moss), and a low frequency of group III. Negroes and many of the Asiatic races, on the other hand, show an almost equal proportion of groups II. and III., while some of the Eastern Asiatics show a preponderance of group III. From west to east there is a fairly steady decrease in group II. individuals and an increase of group III. Group I. is always a rare group, as it contains both agglutinogens, while group IV. is generally represented by between 30 and 50 per cent. A few typical figures are given :—

	I.	II.	III.	IV.
	Per cent.			
500 Englishmen	3	43	7	47
500 Germans..	9	40	13	38
300 Russians (Moscow) ..	8	39	20	33
1000 Hindus	9	19	41	31
500 Negroes (Belgian Congo)	8	22	24	46

These observations led the Hirszfelds to suggest that there were in reality two main stocks of the human race, represented respectively by the agglutinogens A and B of groups II. and III. ; it was assumed that a great deal of intermarriage had taken place, accounting thus for the representation of all groups in every race. This hypothesis led to much research to find out whether the inheritance of group properties were indeed so exact as to be of racial significance. The results of these investigations have led to a general belief that the agglutinogens are racially characteristic. Historical evidence has in several instances born testimony to the soundness of the hypothesis.

Verzar and Weszeczky [2] have examined the group distribution in three quite distinct ethnical nuclei of population in Hungary. These include German colonies dating back to the beginning of the eighteenth century, the Magyars, whose origin was the Urals, and who seem to be related racially to the Turks, and finally the Tziganes coming from India. The comparison between each group of Hungarians and the races from which they sprang shows how the serum characteristics have been maintained.

	I.	II.	III.	IV.
	Per cent.			
German colonists	3	43	13	41
Magyars	12	38	19	31
Tziganes	6	21	39	34
Germans	9	40	13	38
Turks	7	38	19	36
Hindus..	9	19	41	31

Several other instances are recorded which show evidence of a similar nature. On the other hand, it is not easy to understand the marked difference between the groups among Hindus and the Western European races, between which, on other grounds, there seems to be an historical kinship.

Since the Hirszfelds announced their hypothesis, observations have been made among the red Indian survivors of North America. Whereas the white population of the United States shows figures almost identical with those of Western Europe, the Indians show a strikingly different distribution.

The results recorded are as follows:—

	I.	II.	III.	IV.
	Per cent.			
1000 U.S.A. whites (Snyder [3])	3	42	10	45
1134 Red Indians ,,	1	16	4	79

The Esquimaux and some of the Indians of the Argentine Chaco show a similarly great preponderance of group IV. These figures have led Bernstein [4] to make the suggestion that there are three rather than two distinct stocks, represented by groups II., III. and IV. Thus the characteristic of this further racial stock is the absence of agglutinogens.

Blood Groups of a Brazilian Indian Tribe.

My own observations have been made on Brazilian Indians belonging to the Caraja tribe. Although the total number of blood examinations made, including controls, does not much exceed 100, the results are of interest because they are, I believe, the first records of the kind among the million and a half odd Indians in Brazil, and because they differ markedly from any other figures so far published.

The method used was a modification of Beth-Vincent's, which affords the simplest means of identifying the agglutinogens, and is the most easy to carry out.

Two stock sera are required, belonging to groups II. and III. These should contain a reasonably high titre of the agglutinins B and A, which respectively characterise these groups. A drop of each serum is placed separately on a glass slide or porcelain dish, and a drop of the blood to be examined is added to each. If agglutination occurs it can be readily detected by the naked eye as a red precipitate like brick-dust, which takes the place of the homogeneous red mixture. With very rare exceptions this change occurs within less than a minute, and is quite obvious. Additional certainty may be obtained by using the microscope. Under the low power, the agglutinated mixture shows the red corpuscles heaped together in irregular dense masses which are quite different from the rouleaux formation occasionally assumed by the corpuscles in any blood which is allowed to stand.

In obtaining the figures given below, Beth-Vincent's method was modified as regards the proportion of blood to stock serum. Instead of adding a drop of serum to a drop of blood, the end of a thin glass rod was used to transfer a smear of blood from the pricked finger to the serum. In this way the mixture showed a proportion of blood to serum approximately between 1 : 10 and 1 : 5 instead of equal parts. This is a decided advantage, because there is very much less chance of mistaking rouleaux formation for agglutination when the blood is well diluted.

Stock sera were obtained by the kindness of Dr. Vital Brasil, whose name is associated with much important work in immunology.

Sixty-one observations were made among the Caraja Indians, and though the method is simple they were the product of more effort and patience than might be imagined. The Carajas can only be reached after a journey from the coast of a thousand miles overland by rail and automobile to the point of embarkation on the river Araguaya, followed by a 400 miles trip down stream by canoe. Though their tribe probably does not number more than 800 in all it is composed of tiny villages scattered over the course of the Araguaya for a distance of 500 miles. Once arrived among them, the difficulties are but begun. It is only after a great deal of palaver, and a great many demonstrations on his comrades, that the inquisitive white man is allowed to draw the drop of Indian blood. The first to submit to this new form of torture were always a few old widows who looked hungrily at the big bricks of sugar offered as a reward to the brave. They thought any risk worth running for so substantial an addition to their miserable ration. When it was seen that they survived the ordeal so well, children came forward and finally a few of the timid young warriors submitted too.

The results showed that of the 61 Indians :—

3 (5%) belonged to group I.
3 (5%) ,, ,, II.
31 (51%) ,, ,, III.
24 (39%) ,, ,, IV.

As a control, 43 persons of Brazilian nationality were examined in a town some 500 miles distant from the country inhabited by the Carajas Indians. Like most Brazilian towns of the interior, its population is a more or less intimate mixture of black and white. The figures obtained are as follows :—

21 (49%) belonged to group II.
3 (7%) ,, ,, III.
19 (44%) ,, ,, IV.
No group I. individuals were found.

Considering the above observations, it is at once evident that the number of Indians examined is insufficient to serve as a basis for any exact statement of the distribution of the blood groups. On the other hand, the preponderance of the groups III. and IV. is sufficiently overwhelming to show that these two groups are characteristic of the tribe. Further, it should be noted that the 43 controls give figures very closely resembling those quoted by J. Montenegro [5] for 120 Brazilians living in the State of Sao Paulo. Montenegro's figures are : group I., 3 per cent. ; group II., 41 per cent. ; group III. 9 per cent. and group IV., 47 per cent. 1685 cases examined by Duarte [6] in the State of Bahia showed : group I., 2 per cent. ; group II., 30 per cent. ; group III., 8 per cent. ; and group IV., 39 per cent. The large negro element in Bahia makes the figures approximate more closely than those of other Brazilian States to the figures already quoted for the Belgian Congo.

Comment.

In the figures for the Caraja Indians there are two points worthy of special note. In the first place, there is no record of any other race showing so high a preponderance of group III. individuals. The Hindus, already mentioned, show 41 per cent. in group III. Even in their figures, however, there is not such a disparity between groups II. and III. as among the Carajas. Even allowing for errors due to the small numbers examined, this disparity is very striking. The second point is the wide difference between the figures of the Carajas and those of the Red Indians of North America. Unfortunately, the only other figure available for South American Indians is that of S. Mazza and J. Franke,[7] who found 83 per cent. of group IV. in the inhabitants of the Argentine Chaco (quoted by Lattes [8]).

The Carajas are a tribe of river Indians living in a part of Brazil which is practically destitute of settlers. They do not appear either to have made war with the latter or to have entered into any close relations with them. Their attitude is friendly, but reserved, and the instances of intermarriage between Carajas and settlers are extremely rare. On all sides they are surrounded by other more or less savage tribes. Their language and the customs of these Indians have led to the opinion that they do not belong to the same ethnological group as the Tupy-Guarani races of Argentina and Paraguay. Observations made among the Carajas from the serological standpoint lend further support to this view. Although it is still much too early to draw conclusions, it is reasonable to suggest that the Carajas are descended from a mixture of two stocks—the Eastern Asiatic characterised by group III., and the ancestors of the Red Indians of North America, who are very largely group IV. individuals. The well-known disinclination of Indian people to mix with other races perhaps accounts for the much more uneven distribution of groups among them than among European and Asiatic races. It will be noted that the Carajas exemplify these peculiarities.

It is to be expected that fresh light will be thrown on all these matters as figures are obtained for many more of the tribes of Brazil and South America in general. Perhaps then, and then only, the problems of racial origins among these primitive peoples will be fully understood.

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5. Montenegro, J. : Brasil Medico, 1925, xxxix., 109.
6. Duarte : Thèse de Bahia, 1926.
7. Mazza, S., and Franke, J. : Prensa Méd. Argent., 1927, xiv., 408.
8. Lattes, Leon : L'individualité du Sang, Paris, 1929, p. 135.

THE ANTISCORBUTIC VITAMIN IN APPLES.

THE apple has not been considered in the past as a good source of the scurvy preventing vitamin. In a report [1] just issued by the Medical Research Council, however, M. F. Bracewell, E. Hoyle, and S. S. Zilva describe very considerable differences in the anti-scorbutic content of apples according to the variety. Of all the home grown and colonial varieties tested by them the English cooking apple known as Bramley's Seedling was found to be decidedly the most active. The relatively high activity of this apple is apparently one of its hereditary characteristics, and is not related in any way to the soil in which it is produced. The age of the tree or the conditions under which the apples are cultivated have no apparent influence on the amount of antiscorbutic vitamin in the fruit. The Dabinett, a cider variety, ranked next to Bramley's Seedling and Cox's Orange Pippin came third in the list in respect of antiscorbutic activity. Canadian dessert apples had almost the same activity as corresponding English varieties, whereas Australian and New Zealand apples were not as potent. The fall in the potency of the last-mentioned group is probably related to the increased time that elapsed between the picking and testing of the fruit. Little loss was found in the antiscorbutic activity of English grown apples during three months storage in air at 1° C. Storage in a mixture of carbon dioxide, nitrogen, and oxygen at 10° C. for the same period produced a definitely greater loss of activity. It was found that baking apples in their skins for 50 minutes till the flesh was quite soft scarcely affected their antiscorbutic potency. It is hoped that a continuation of experiments on these lines may throw further light on the physiological properties of the antiscorbutic vitamin, and even help to reveal its identity. Meanwhile, it is of some practical importance to have established the fact that relatively potent antiscorbutic apples can be produced.

THE PROFESSIONAL CLASSES AID COUNCIL.

THIS Council exists for the relief of distress among members of the professional classes, and its procedure is to avoid doles and give immediate pecuniary help when needed. The Council has just issued its ninth annual report which shows that its operations are continually increasing. During the year, May 1929 to April 1930, 1077 applications have been considered as against 920 last year, and financial assistance has been given to 239 families, 25 persons have received grants of clothing, and advice has been given to 277 applicants—this last being often an extremely valuable form of assistance. It is regrettable that the total income of the Council shows a drop of nearly 10 per cent., while the amount spent in relief has increased by nearly 7 per cent., and the Council plead for an increased donation list in view alike of past responsibilities and future activities. The fund justifies every request on its behalf, and the address of the Council is 251, Brompton-road, S.W.3.

[1] Med. Res. Council Special Rep. Ser., No. 146. The Anti-scurvy Vitamin in Apples. London, H.M. Stationery Office. 1930. Pp. 45. 9*d*.

IN THE MATTER OF AGE-LIMIT.

To the Editor of THE LANCET.

SIR,—The letter from "Ex-Temporary Civil Servant" in your current issue is timely. I, too, find all roads barred because I am aged 49 years; indeed, I see that a practitioner aged 27 to 30 years is, in your advertisements, considered to be experienced. My own experience is as follows: early successes and resident experience, honorary physician to two important hospitals, and post-graduate study under Sir James Mackenzie. On the outbreak of war, being in the colonies, I came to England at my own expense. I served in France in the front line in 1915–16. I was consulting physician on heart disease in Salonika, 1917–18; Chairman of the Special Medical Board for Civil Servants (Ministry of National Service) and Chairman of the Consulting Board at Chancery-lane; Staff Deputy Commissioner of Medical Services to the first decentralised Region of the Ministry of Pensions; Commissioner of Medical Services for Yorkshire (Ministry of Pensions), with final decision on medical matters, the control of 32 medical boards, many treatment clinics, and hospitals containing nearly 3000 beds, while my signature covered an expenditure of at least £3,000,000 per annum. I find myself now debarred from any work under the Government, under local authorities, and even privately, because I am too old.

I am, Sir, yours faithfully,

ANOTHER EX-TEMPORARY CIVIL SERVANT.

July 26th, 1930.

STERILISING WATER BY THE CATADYN METHOD OF KRAUSE.

About 50 years ago the Swiss biologist, Carl v. Nägeli, made the observation that micro-organisms died in water which was kept for several weeks on end in vessels of silver or copper. He could offer no explanation of this effect, as he was unable to detect the presence of any metal in solution and his experiments precluded the possibility of the germs having been killed by radiation. He called the phenomenon "oligodynamics," and after his death Dr. G. A. Krause, Munich, a physicist, and others, confirmed and extended his observations. The catalytic-dynamic properties of finely divided silver have been utilised in the "catadyn" method of sterilising water. The effect of minute quantities of the spongy metal distributed over porcelain rings, beads, or particles of sand on the living organisms in water has been accurately measured; in most instances the colon bacillus has been taken as the test organism. It is claimed that the filtrate also in some mysterious way acquires and retains the germicidal power originating in the materials of the catadyn process. Severe and prolonged critical tests have been applied and the evidence advanced is remarkably convincing. Before it can be applied on a commercial scale the question of expense of materials and containing vessels will require scrutiny, but a prima facie case has been made out for the consideration of the physicist, the biologist, and the public health expert. A demonstration of the method before an informed audience would seem to be the next step.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post.—We are, Sir, yours faithfully,

J. AND A. CHURCHILL.

Gloucester-place, W., July 29th, 1930.

WESTBURY COTTAGE HOSPITAL.—The hospital is about to be rebuilt at a cost of £9500. There will be 20 beds, two of them in a private ward.

Vacancies

For further information refer to the advertisement columns.

Altrincham General Hospital, Cheshire.—Sen. H.S., and Jun. H.S. At rate of £150 and £120 respectively.
Barnsley, Beckett Hospital and Dispensary.—H.P. £140.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Bath, Royal United Hospital.—Asst. H.S. At rate of £120.
Birmingham, City Hospital, Little Bromwich.—3rd and Jun. Asst. M.O.'s. £350 and £300 respectively.
Birmingham General Hospital.—Res. H.P. £70.
Birmingham, Midland Hospital, Easy-row.—H.S. £200.
Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.
Brentwood, Essex, High Wood Hospital for Children.—Asst. M.O. £550.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Cardiff, Welsh National School of Medicine.—Demonstrator in Pathology and Bacteriology. £250.
Chester County Mental Hospital.—Jun. Asst. M.O. £350.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100–£175.
Colchester, Essex County Hospital.—Asst. H.S. and Registrar. £120.
Croydon County Borough, P.H. Dept.—Asst. M.O.H. for Obstetrics. £600.
Derbyshire Royal Infirmary, Derby.—Ophth. H.S. £150.
Doncaster Royal Infirmary.—Three H.S.'s and one H.P. All at rate of £200.
Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.
Durham County Council.—District Tuber. M.O. £500.
Durham County Sanatorium, Holywood Hall, Wolsingham.—Locum. Seven to 9 guineas weekly.
East Ham Memorial Hospital, Shrewsbury-road, E.—H.S. to Special Depts. and Cas. O. At rate of £120.
Glasgow Univ.—Samson Gemmell Chair of Medical Pædiatrics.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. Also H.P. At rate of £200 and £135 respectively.
Golden-square Throat, Nose and Ear Hospital, W.—H.S. £100.
Halifax Royal Infirmary.—3rd H.S. £125.
Hertford County Hospital.—H.P. At rate of £150.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Ilford, King George Hospital.—Res. M.O. £200.
Kilmarnock Infirmary, Ayrshire.—Res. M.O. £140.
Lancaster, County Mental Hospital.—Temporary Asst. M.O. Seven guineas weekly.
Manchester, Royal Infirmary, Roby-street.—Jun. H.S. and Cas. O. £100–£200. Also Four Technical Assts. for Clin. Lab. work. Each £200.
Manchester University.—Amy Henrietta Worswick Fellowship. £150.
Manchester, Victoria Memorial Jewish Hospital.—Hon. Surgeon
Manitoba University.—Professor and Asst. Professor of Anatomy. $5000 and $3500 respectively.
Margate and District New General Hospital.—Res. M.O. £125.
Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. £250.
Merthyr General Hospital.—Res. H.S. At rate of £150.
Newark General Hospital.—Res. H.S. At rate of £175.
Nottingham, Hospital for Women.—H.S. At rate of £150.
Nottingham and Midland Eye Infirmary.—Res. H.S. £200.
Plymouth, South Devon and East Cornwall Hospital.—Hon. P. and Hon. Asst. P.
Queen's Hospital for Children, Hackney-road, E.—Cas. O. At rate of £100.
Richmond, Surrey, Royal Hospital.—Jun. H.S. At rate of £100.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Romford, Essex, Oldchurch Hospital.—Res. 2nd and 3rd Asst. M.O.'s. Each £250.
Saint Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—Res. Surg. O. At rate of £150.
Salford, Hope Hospital.—Res. Surg. O. £400.
Sheffield National Radium Centre.—Medico-Physicist. £600-£800
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Sheffield Royal Infirmary.—H.S. At rate of £80.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160
Southampton Borough Hospital.—Res. M.O. £350.
Truro, Royal Cornwall Infirmary.—H.S. £170.
Walsall General Hospital.—Cas. H.S. At rate of £120.
Walsall Manor Hospital.—1st and 2nd Asst. M.O.'s. £200 and £150 respectively.
West Ham County Borough.—Deputy M.O.H. £850.
Willesden General Hospital, N.W.—Registrars.
Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. £200. Also H.S. £150.
Wolverhampton, Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £125.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Somercotes (Lincolnshire) Pontesbury (Shropshire); and at Neath (Glamorganshire).

The Secretary of State for the Home Department gives notice of a vacancy for an Ophthalmic Referee under the Workmen's Compensation Act, for the districts of the County Courts in Circuit No. 1 and the districts in part of Circuit No. 2 (Northumberland and Durham). Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W., not later than August 16th.

CASUALTIES AT SHEFFIELD ROYAL HOSPITAL.—The casualties dealt with at this institution during the first half of the present year numbered 11,156, an increase of 659 over the corresponding period of 1929. Traffic accidents numbered 574, of which 231 were caused by motor cars and 190 by motor-cycles.

ADDRESSES AND ORIGINAL ARTICLES

SYPHILIS OF THE HEART AND GREAT VESSELS.

By Carey F. Coombs, M.D., F.R.C.P. Lond.,
PHYSICIAN, AND IN CHARGE OF THE UNIVERSITY CENTRE OF CARDIAC RESEARCH, GENERAL HOSPITAL, BRISTOL.

LECTURE II.*

In my first lecture the share of organic disease of the heart and great vessels to be ascribed to syphilis was assessed at 5 to 15 per cent., and reasons were given for believing that this is a direct relationship; the more syphilis, the more aortic disease. For this reason, males more often show signs of cardiac syphilis than do females. There is usually a latent period of 20 to 25 years between the primary infection and the onset of cardiac symptoms. In this, cardiac syphilis resembles neurosyphilis. Different aspects of cardiac disease were reviewed in their relation to syphilitic infection, with results that I have for convenience arranged in Table IV.:—

TABLE IV.

Forms of cardiovascular disease.	Percentage caused by syphilis.
Aortic aneurysm—	
Thoracic ,,	75
Abdominal ,,	35
Aortic regurgitation	30
Cardiac pain (transient)	15
Cardiac infarction	1–3
Ventricular failure	20
Heart-block	10
Auricular failure	2

To-day we have to construct from a series of case-notes a composite picture of cardio-aortic syphilis as the clinical observer sees it. In a majority of the 103 cases whose records are under review, the *symptoms* that brought the patients to seek advice were cardiac. In a minority other lesions—cerebral thrombosis, tabes, and so forth—stamped them as syphilitic, and this led to an investigation of the cardiovascular system, with the result that physical signs in these few cases preceded symptoms. For the most part, however, symptoms came first and signs lagged behind. I recollect one remarkable exception to this rule in the case of a man of 47, the master of a small vessel, who went to get his life insurance policy increased when he came ashore. To his surprise and indignation this application was rejected on the score of heart disease. Refusing to believe this, he consulted his doctor, who referred him to me for confirmation of a diagnosis of aortic regurgitation. Unmistakable signs were found and, as his Wassermann reaction was positive, we gave him a course of treatment with iodide of potassium, mercury, and novarsenobenzol. He went back to his vessel, still free from symptoms and openly sceptical about his cardiac lesion; but a few days later he failed to come on deck one morning, and was found dead in his bunk. This sequence is exceptional. The rule is that the patient feels something amiss, the principal symptoms of onset being dyspnœa on exertion and præcordial pain; he goes to his medical man and is found to present signs of heart disease. The three great cardiac symptoms—dyspnœa, pain, and œdema—appear in that order, both in sequence and frequency. Dyspnœa, noted in 85 instances, is an early symptom; so is pain, complained of by 58 patients; but œdema, together with other signs of ventricular failure, is only seen later. It was recorded in 43 of my 103 cases. The paroxysmal dyspnœa noted by Keefer and Resnik and other observers has been seen in several of my patients, and my experience tallies with theirs in that this symptom has been much more frequent in syphilitic than in rheumatic lesions of the aortic valves. I should have said, however—though I have not subjected this to the test of statistics—that these paroxysms of dyspnœa are seen even more often in persons with ventricular defeat ensuing on long-continued hyperpiesis. This clinical fact—the occurrence of periodic dyspnœa in these two conditions, hyperpiesis and cardio-aortic syphilis—seems to me a striking exemplification of Fraser's proposition that the chief factor in the production of cardiac dyspnœa is a failure in the delivery of blood to the periphery and therefore to the medulla; for it is in these two kinds of heart disease that the left ventricle is most signally defeated.

Pain in the præcordium was a prominent symptom in 58 cases—i.e., in more than half. There are two or three points worthy of note about it. First, it seems to me that the "angina of decubitus" as contrasted with "the angina of effort" is relatively common in cardiac syphilis; commoner, that is, than in hyperpietic and decrescent syndromes. A good example of this was seen lately in the case of a man of 40, recently under my care in the hospital.

He was admitted under a diagnosis of pneumonia, on the score of dullness with other appropriate signs in the left upper chest. This resolved very unwillingly, and as it did so he developed pain in the right shoulder and across the chest. It was of the characteristic pressing or squeezing type and made him pale and anxious, and although it was aggravated by movement it arose and continued during rest in bed. The triple rhythm so characteristic of serious injury to the ventricular wall was heard for several days, the pulse became alternating, and there was some œdema of the back. His reaction to the Wassermann test was strongly positive, and his progress under the appropriate treatment happily confirmed the diagnosis.

In this case also another feature of the cardiac pain of syphilis—its tendency to an atypical distribution—was exemplified. In one respect, however, the case was unusual, since there was a suspicion of the infarction syndrome about it. The points essential to a confident diagnosis of cardiac infarction appear to me to be, first, a period of severe and persistent præcordial pain; and, second, the addition of new physical signs indicative of change in the texture of the cardiac wall. This syndrome has only once in my experience been seen in an unmistakable guise in this group of 103 cases of cardiac syphilis. This contrasts strikingly with its relatively high incidence in cardiosclerosis of the senile or decrescent type—15·1 per cent. of a group of over 300 cases. Let me make it clear; in cardiac syphilis pain without immediate sequelæ is commoner, while symptoms of the kind that accompany cardiac infarction are much rarer, than in the degenerative types of myocardial disease.

Physical Signs.

The signs may conveniently be grouped under three headings: the aorta and other great vessels, the cardiac valves, and the muscular wall of the heart. I have been a little surprised to find that I only noted ten examples of *aortic aneurysm*—one of them

* The second Lumleian Lecture, 1930. Lect. I. appeared last week.

abdominal, the rest thoracic—among these 103 patients. My impression is that one sees fewer cases of thoracic aneurysm than formerly, but the Registrar-General's returns, though they show some remarkable fluctuations in the annual death-rate from aneurysm, furnish no clear evidence of a decline.

Since the subject of intrathoracic aneurysm was recently expounded here by the late Dr. de Havilland Hall,[23] I propose to say no more on its clinical features but to pass on to a word or two about non-aneurysmal dilatation of the aorta. This I noted in 32 other cases, but I feel sure that this figure is too low, and that if it had been possible to subject all my private patients, as all my hospital patients are subjected, to skiagraphy, it would have been a good deal higher. Increase in the width of the aortic dullness, or of its shadow, or both, is of particular value in the diagnosis of those difficult cases in which there are no signs of valvular or myocardial disease to explain symptoms of cardiac insufficiency. An interesting paper by Beretervide[5] furnishes examples of the application of skiagraphy to the diagnosis of aortitis in congenital syphilis. Detection of a widened aorta is, however, not essential to a diagnosis of cardiac syphilis. Recently we had in the wards a man who had complained of substernal pain ever since a car had knocked him down and broken some ribs. This pain was increased by exertion, he was easily made breathless, and his pulse pressure was low, but there were no physical signs beyond a moderate accentuation of the second sound to the right of the sternum, and his aortic shadow was not widened. Nevertheless, the Wassermann test was definitely positive. In this instance we noted that highly characteristic sign, accentuation of the aortic second sound. It is usually of a lower tone than that which is heard in hyperpiesis, and when it is noted in the appropriate context, and in a person whose blood pressure is not raised, it helps to confirm a diagnosis of cardiac syphilis. It is often found in patients with tabes dorsalis and other nervous lesions and may then persist without further development for years. Even so, however, one cannot look at a section of the aortic wall that has been attacked by syphilis without realising that here alone, in a loss of arterial elasticity, the cardiovascular system has suffered a serious impairment of efficiency.

The series includes one example of syphilis of the pulmonary artery, a woman of 39, who exhibited the Ayerza syndrome. That the lesion was syphilitic was proved by the discovery of posterior sclerosis in the cord. This case has been fully reported in a paper by Clarke,[8] Hadfield, Todd, and myself, and is included in an excellent summary of the whole subject recently published by Dorothy Hare[24] and Joan Ross, from whose conclusions I quote a passage which is in accord with my own views. They say:

> "A well-defined group of cases exists in which arterial disease is confined or largely confined to the pulmonary circuit. These cases differ from other cases with arterial lesions in the lesser circuit in that there is no antecedent pulmonary, cardiac, or bronchial lesion. Syphilis is by far the most important ætiological factor in older patients. Primary non-inflammatory sclerosis of unknown ætiology is found in younger patients. In the syphilitic cases the lesions in the intrapulmonary arteries take the form of an obliterative arteritis, usually most severe in the smaller branches and arterioles. This condition leads to a raised blood pressure in the lesser circuit. Dilatation and hypertrophy of the main pulmonary artery follows, with atheroma of the right and left pulmonary arteries and larger branches, whether the latter show inflammatory lesions or not. The right side of the heart becomes greatly dilated and hypertrophied. Clinically the cases are characterised by dyspnœa, cyanosis, and hæmoptysis, and in the later stages by progressive congestive heart failure with a regular pulse."

Three times, in patients with no evidence of aneurysm, I noted inequality of the brachial tensions, but in none was there the gross asymmetry recorded in syphilitic aortitis by Laignel-Lavastine[54] and Vinlich. It is, however, by no means limited to that disease. I have seen several examples i patients with arterial lesions that appear to b degenerative and not infective, and at the preser time there is a man, aged 62, attending my ou patient department, suffering from the angina effort and also from an intermittent limp; his systol brachial pressures are grossly unequal—240 in th one arm, 180 in the other. This man is proved fr from syphilis by every test that we can apply. Lian, Dreyfus, and Puech express the opinion that arterit interfering with the blood-supply to the upper limb is more likely to be syphilitic than a correspondin disorder of the lower limbs. Even so, however, it to be remarked that among the seven cases full reported by them in which a diagnosis of subclavia arteritis was made, only two were proved syphilit in origin. One physical sign which they descrit is a systolic murmur heard on auscultation in th depths of the supraclavicular fossa and separated, b a zone in which no bruit is heard, from the systol murmur usually heard at the base of the hear This subclavian murmur, they say, is not transmitte to the axillary or brachial arteries. In one case und his care in the Tenon Hospital Prof. Lia demonstrated to me this murmur, which was clear heard and separated easily from that at the base the heart.

Signs of some form of *aortic valvular disea* were noted in 63 cases. In 54 this is recorded regurgitation, in two as obstruction, in seven regurgitation with obstruction. The logical mea of discriminating between the two appears to me lie in correlation of sphygmomanometric readin with the auscultatory signs. Take, for example, th case of a man of 56 admitted to the wards on accou of præcordial pain and dyspnœa. The sounds hea at the aortic base were those of obstruction rather tha regurgitation, for the systolic murmur was loud an accompanied by a thrill, while the diastolic murm was at times scarcely audible; yet the minimu arterial pressure was only 50 mm. Hg, with maximum of 125—a disturbance of the norm proportions which would lead me to judge that th valves were guilty rather of incompetence tha of obstruction.

Some observers say that they find the aort diastolic murmur liable in a number of cases to appe and then to disappear, and this inconstancy ascribed to variations in the width of the aortic rin variations which are thought to arise from a weakeni of the aortic wall by disease. I note that Sir Thom Horder remarks that this is contrary to his experienc that the aortic diastolic murmur, when once it com comes to stay. So at all events it has been with m cases, though when the murmur was first heard one or two instances it was very faint and apt to inaudible except under favourable conditions. Hord also alluded to the sudden and gross increase in t loudness of the murmur that occurs when an aor cusp is ruptured, and illustrated this by reference a dramatic example. I had no instance of this my series, but examination of the aortic cusps in t syphilitic heart affords ample evidence of the likeliho of this disaster. The perforations that Corrig figured and described as "reticulations" are oft seen at the commissural ends of the cusps, and m perhaps be ascribed to the concurrence of two facto —tightening of the base of the cusp with starvati of its tissues.

A mitral systolic murmur was noted 24 times in n patients; in 14 it accompanied signs of a lesion of t aortic valves and in 10 it occurred alone. In the 10, as well as in the others, it seemed to me probab that the incompetence was muscular and not valvula a belief that was verified post mortem in the case a man who had a mitral systolic murmur througho the three years during which he was under observatio His mitral valves were normal, but the auricu ventricular channel was widely stretched. In o other case, that to which I have already alluded discussing lesions of the pulmonary artery, a diasto murmur was heard to the left of the sternum. T

patient was very blue and distressed and I thought the murmur indicated mitral stenosis, but was puzzled because the rhythm of the heart was normal. She died the next day and the pulmonary origin of the murmur was then disclosed.

The fact that this murmur was heard to the left of the sternum reminds me of a statement made some years ago by Hoppe-Seyler, to the effect that in aortic incompetence of syphilitic origin the diastolic bruit is heard loudest to the right of the sternum, whereas in leakage caused by rheumatic endocarditis the diastolic murmur is best heard to the left of the sternum. I believe that this rule is broadly true and agree with the explanation offered—namely, that whereas the syphilitic lesion of the valves is usually accompanied by a dilatation of the aorta which conducts the vibrations up to the chest wall at the second right interspace, that of rheumatism is not thus complicated, and the vibrations are, therefore, heard best in the neighbourhood of the valves themselves, to the left of the sternum.

Interference with the *muscular functions* of the heart is a prominent feature of cardiac syphilis. It is because the disease has this faculty that it is so dangerous. The means by which it effects these injuries must be debated when we come to survey the morbid anatomy; to this, however, an analysis of the modes of myocardial disturbance will serve as an introduction. The total arrhythmia of auricular fibrillation was observed in eight cases, and in addition to this there were two verified and one probable example of flutter. This is rather a high proportion of auricular disturbances. Juster[80] and Pardee noted three examples in 50 cases. In Vela's[54] series of 105 cases examined electrocardiographically there were six examples of fibrillation. In my series there was no obvious difference, otherwise, between the hearts that fibrillated and those that did not. In five of the eight the aortic valves were leaking—a proportion almost exactly the same as that observed in the series as a whole.

Interference with conduction of the stimulus from auricles to ventricles was observed in six instances, three of these being examples of block of the main bundle varying in degree from time to time. Of the others, one displayed the electrocardiogram of a lesion of the right main branch of the bundle, while in the other two the auriculo-ventricular interval was lengthened. This last group would perhaps have been much larger if electrocardiograms had been taken in all cases, yet Juster and Pardee's 50 cases only yielded two examples of lengthened conduction interval and none of actual block. Of Vela's 105 electrocardiograms from cardiosyphilitics three showed block of the main bundle and two of the right branch.

There were signs of increase in the size of the left ventricle in 80 of the cases. It seems to me useless to pretend to discriminate here between dilatation and hypertrophy, for there is no disease of the heart in which these two aspects of ventricular increase are more often or more inseparably combined. In 20 cases there were signs of the gross form of myocardial inadequacy that has been entitled by Parkinson[41] and Bedford "heart failure with normal rhythm," and by French writers "ventricular failure," a term also used by Herapath[11] and myself in a review of different modes of cardiac breakdown. The principal features of this state are œdema below the waist-line, alternating pulse with narrowing of the pulse pressure in some instances, weakening of the impulse and of the cardiac sounds, with a bruit de galop in some cases. This form of failure is notoriously insidious in its evolution, and the signs enumerated are not discovered until it is already far advanced. Does electrocardiography furnish any earlier hints of its approach? My own experience is too small to furnish a reply to this, but some interesting data have been collected. For example, Dr. J. H. Follows, of Liverpool, in some observations which he was good enough to discuss with me, noted alterations in the QRS and the T parts of the electrocardiogram 40 times in 147 cases of syphilis. It is true that in most cases these alterations were slight, but I believe they are worthy of attention. I have tabulated these (Table V.), together with other electrocardiographic data, including an unpublished series collected by Dr. M. A. Cassidy, of which he has kindly made me free.

TABLE V.—*Electrocardiographic Changes in Cardiac Syphilis.*

Author.	Total cases.	P abnormal.	P–R long.	QRS abnormal.	T abnormal.
Early syphilis:					
Cassidy ..	12	0	0	Low voltage, 3. R aberrant, 1.	0
Follows ..	68	0	0	Low voltage, 2. R aberrant, 5.	8
Turner[53] and White ..	50	No gross abnormality.			
Late syphilis:					
Cassidy ..	28	3 Fib., 1. Flut., 1.	0	Low voltage, 11. R aberrant with abnormal.	T = 8.
Follows ..	73	Flut., 1.	1	Low voltage, 1 R aberrant, 15.	9
Vela ..	105	Fib., 6.	S.bl.3 B.bl.2	7	9
Juster and Pardee ..	50	,, 3	2	20	37
Coombs ..	20	,, 1	2	4	5

Fib. = fibrillation; Flut. = flutter. S.bl. and B.bl. = Simple and branch block.

If any broad generalisation can be made from these widely divergent results it is that unmistakable departure from the normal is seen in an appreciable percentage of the electrocardiograms from cases of late cardiac syphilis. Among these observations we may particularly note that in Juster and Pardee's series the T wave was abnormal in 74 per cent. and of a "coronary" type of aberration in 18 per cent. This last they thought they could correlate, by post-mortem observation, with occlusion of the coronary orifices. I doubt, however, whether the evidence of coronary disease derived from electrocardiography is as valuable in syphilitic infection as in the degenerative lesions of the coronary vessels.

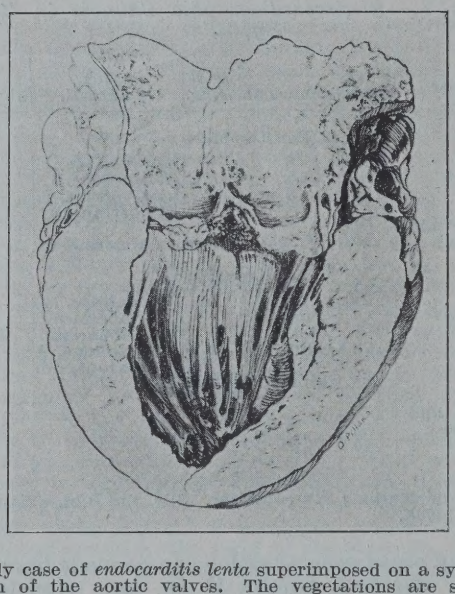
THE CLINICAL PICTURE.

At this point we may pause to summarise and, so to speak, get into focus the clinical picture that has been drawn. What we see is a man just under 50 complaining of shortness of breath and often, also, of pain in the chest, usually excited by exertion, but sometimes also occurring spontaneously. If his symptoms have lasted any length of time there may be œdema about his ankles. Examination of the chest discloses the signs of enlargement of the left ventricle, and the chances are two to one that there will also be those of aortic valvular disease. There is a one in ten chance that he has an aneurysm of his thoracic aorta, and where this is not found there is an even chance that there will be some evidence of aortic dilatation. The cardiac rhythm is likely to be normal, but there is approximately one chance in ten that either a total arrhythmia or an alternating pulse will be noted. His electrocardiogram may show some drag in auriculo-ventricular or in trans-ventricular conduction, or an aberration of ventricular response such as we associate with coronary lesions. On inquiry he may furnish a history of syphilitic infection sustained twenty odd years ago; or his Wassermann reaction may be positive; or he may display other evidence of old syphilitic infection.

In my series of 103 patients these evidences of *other syphilitic lesions* were noted 26 times. The manifestation seen most often was tabes dorsalis, of which there were ten examples; add to this two and possibly three cases of general paralysis and three of internal ophthalmoplegia, and the tale of late parenchymatous syphilis mounts up to 16

cases. Focal lesions of cord and brain were noted two and three times respectively; there was one example of nerve deafness, one of optic atrophy, one of iritis, and two of choroiditis. Chronic glossitis was

FIG. 1.



An early case of *endocarditis lenta* superimposed on a syphilitic lesion of the aortic valves. The vegetations are seen to occupy the commissural ends of the cusps.

noted five times. This seems to me to fall within the same class, clinically and perhaps pathologically, with aortitis and tabes. Gummatous lesions of bone, liver, larynx, and scalp were found in nine cases. Two of the patients had syphilitic children and in three instances repeated miscarriage appeared attributable to a similar cause. I have seen no example of conjugal aortitis such as is recorded by Marañon.

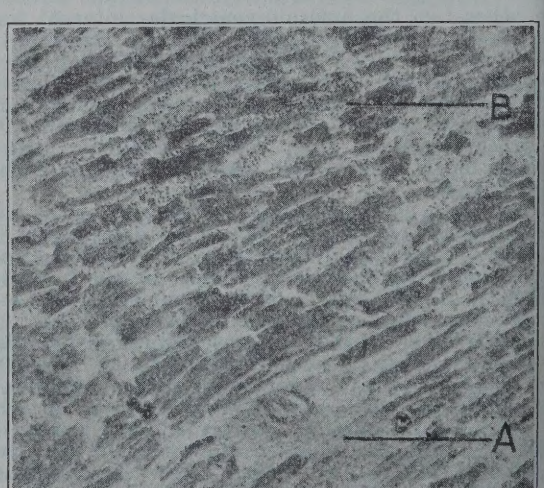
Certain other morbid associations are worthy of consideration here. These are more truly described as concomitants than as precursors. That the progress of cardio-aortic syphilis itself is not greatly furthered by them is, I think, proved by the fact that in *congenital syphilis* the aortic lesion appears at the end of a latent period no longer than that observed in the corresponding and exactly similar lesion of the acquired infection. In fact, the congenital infection often injures the aorta in an appreciably shorter time than that taken by the acquired variety, as I pointed out in the first lecture. It is true that this is not always so. The only two cases that I am able to quote from Bristol experience behaved in this respect as acquired syphilis does. The first case is one that was recorded in 1911 by Prof. J. A. Nixon, that of a young woman who died in the Bristol Royal Infirmary at the age of 20, after a few months of symptoms due to an abdominal aneurysm which ruptured behind the peritoneum. She had Hutchinsonian teeth and changes in the wall of the aorta of a syphilitic character. The second patient was also a young woman, aged 25, who was admitted to the Bristol General Hospital under my colleague Dr. Newman Neild, to whom, and to Prof. Geoffrey Hadfield, then pathologist to the hospital, I am indebted for notes. These show that when admitted she had Hutchinsonian teeth and was in fact treated as syphilitic from the second day after admission. Her symptoms were cerebral and became rapidly worse, killing her in a few days in spite of an operation for decompression. She had a gummatous infiltration at the base of the brain, and an aortitis of which Prof. Hadfield says that it is the cleanest and purest specimen of syphilitic aortitis that he has seen. The coincidence with an atheromatous change is not infrequent, and is very confusing to the morbid anatomist. In neither of these cases do I think there can be doubt either of the existence of an aortitis or of the syphilitic basis of that lesion. So far as the two examples quoted are concerned, the case for a belief in aortititis due to congenital syphilis seems to me complete. Sometimes this is slow in its evolution, as in another case related to me by Prof. Nixon. Here a maiden lady died at the age of 48 of thoracic aneurysm; there was as little doubt that her father had acquired a syphilitic infection as that she herself had not. On the whole, however, there is a larger proportion of early cases among the congenital than among the acquired syphilitics. For instance, there are the cases reported by Cummer[17] and Dexter, by Anderson,[4] and by Worster-Drought[60] and Danvers-Atkinson, wherein the ages at death were 5, 10, and 13 respectively.

Concomitants of Cardio-aortic Syphilis.

From such facts as these it seems probable that the virus can, unaided, bring about serious changes in the aorta within a period of less than 20 years, and that it is not necessary to invoke any *x* factor or factors as essential to the development of a syphilitic aortitis. On the other hand, it is, I think, quite clear that certain other agencies which are often convicted of an attack on the cardiovascular apparatus do from time to time conspire with the syphilitic virus in such a way as to hasten the downfall of those structures and functions which they attack simultaneously. It is not the syphilitic process itself so much as its consequences that they aid and accelerate. I am thinking particularly of four such agents—decrescent or atheromatous arterial disease, hyperpiesis, alcoholism, and diabetes. To this list may be added one other example, that of acute rheumatism.

The part played by atheromatous or senile *arteriosclerosis* I had always vaguely suspected; it is obvious that when these changes overtake a man they are going to make more difference to him, or at all events

FIG. 2.



Section of myocardium from a case of *endocarditis lenta* superimposed on a basis of cardiac syphilis. (A) replacement fibrosis due to syphilis; (B) polymorphonuclear leucocytosis caused by infected embolus from inflamed valve.

are going to be felt more quickly, if the elastic tissue of his aortic wall is already disintegrated by syphilis. But it was not until I had seen, in more than one of the hearts examined histologically, how syphilis and atheroma supplement each other that I understood how neatly and effectively these two destroyers

ork together. It is not merely that in the wall of he aorta itself they overlap; here we may truly ssign the leading part to syphilis, which attacks nd injures the media in a way that the purely degenerative process is incapable of doing. It is not here, however, so much as in the coronary arteries that the dovetailing of these two morbid agencies is seen, for in the coronary vessels themselves it is atheroma that does the damage, the syphilitic lesion limiting itself to their orifices. In sections of many coronary trunks I did not once discover an infective arteritis, and in the twigs only once I discovered it; even when the ortic lesion was severe it always stopped short at ie coronary openings.

FIG. 3.

ection of wall of left auricle, showing small granuloma beneath epicardium.

The relation with *high arterial tension* is perhaps : the same kind, though some observers think it oes deeper. In my own series I met with 15 patients ho exhibited a systolic blood pressure of 200 mm. Hg r more. One might well dismiss this as due to nothing iore significant than the fact that both aortic yphilis and raised arterial tension are diseases of iiddle-aged males, were it not for the arguments dduced by some writers, French physicians in articular, on behalf of a closer relation. Lian, for xample, gave me some figures which show that in 9 per cent. of 291 persons with high tension the Vassermann test yielded a positive result.

Diabetes was discovered by Mitchell Bruce [6] to be a requent accompaniment of syphilitic disease of the irculatory organs. I have not encountered a single xample. Marañon [39] noted it 23 times in 140 cases f aortic syphilis, and insists on the importance of emembering this association whenever a patient ith diabetes is being examined.

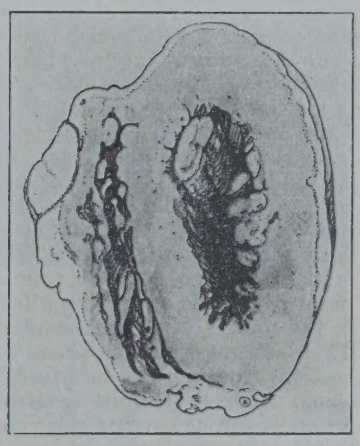
Alcoholic excess was recorded in 16 of my cases. he actual proportion is probably higher than this, ut there is no proof of any causal relation—no proof, hat is, of anything in the effects of alcoholic excess hat favours the course of the syphilitic process. Yet can scarcely be doubted of any of these three agents—yperpiesis, alcohol, diabetes—that it is a powerful ally f syphilis in the reduction of the cardiac efficiency; the rst, by increasing the load to be borne; the second, by s deleterious action on the myocardial cells; and the ast, by ruining the nutrition of the arterial walls.

The effect of *acute rheumatism* on the syphilitic eart may be glanced at in passing. Some years ago saw an interesting example of this. A man about 0, with old-standing aortic incompetence, syphilitic n origin, was attacked by acute rheumatism with ericarditis and quickly succumbed. There are everal examples of this deadly association in the terature (von Glahn [56] and Wilshusen, Cabot [7]). t seems also as if congenital syphilis predisposes o severity in an intercurrent rheumatic carditis; t all events the two are sometimes associated, as in the case related in the first lecture, that of the congenital syphilitic girl, who displayed signs of mitral stenosis before the age of ten (see also Stolkind [48] and Fordyce [21]). On the other hand, the supervention of a syphilitic lesion on a rheumatic basis does not seem to be so serious.

One other disease that is associated with cardio-aortic syphilis owes that association to a different kind of nexus. *Endocarditis* is superimposed on the syphilitic picture in the same way and for the same reason that it is even more often superimposed on that of rheumatic heart disease. It is because the new infection, usually streptococcal, finds it easier to attach itself to a valve that has been made ready for it by some prior injury to its endocardial surface. This relation has been satisfactorily examined by Grant, Wood, and Jones. They say that small platelet thrombi occur with greatest frequency on the valves that are liable to subacute bacterial endocarditis; that this is due to local secondary change in thickened valves; and that in this clot the passing micro-organisms find board and lodging. In my own experience both rheumatic and congenital defects of the valvular surface furnish these opportunities of endocardial infection more often than does syphilis, which has not been identified as a predisposing cause in more than 5 per cent. of my cases of endocarditis. This figure is far below that given by some writers, for instance, Sumbal, [49] who found a positive Wassermann reaction in 18 of 52 cases of endocarditis lenta. Among these 103 cardiosyphilitic patients of mine there were four who were found to have contracted an endocarditis superimposed on the syphilitic lesion (Figs. 1 and 2). The general behaviour of these cases is that of a slow endocarditis of the kind that is usually thought to be due to an alimentary streptococcus. In one of them it was clear that treatment with novarsenobenzol did good, but chiefly in the direction of suppressing the secondary infection, since fever and embolic symptoms disappeared while the liability to præcordial pain and the signs of aortic insufficiency persisted, and the patient died within a year after leaving the hospital.

These few remarks on the morbid influences that may supplement that of syphilis in its attack on the heart may be summarised by saying that atheroma, alcoholism, and diabetes act simultaneously with syphilis in lowering the vitality of the cardiac muscle; while streptococcal infection of the endocardium, itself in these cases a sequela of the syphilitic process, involves the patient in new perils, those of toxæmia and of embolism, while at the same time adding to the cardiac burden by accelerating the valvular failure.

FIG. 4.



(Not referred to in text.) Transverse section of heart showing calcified gumma beneath epicardium of right ventricle.

We are now brought to that point at which clinical investigation can carry us no further in elucidating the nature of the syphilitic attack on the heart. We have seen that in these 103 cases the damage was freely assigned to the aorta, the aortic valves,

and the cardiac muscle; facts that appear clearly in the following table, wherein are assembled some of the data that our clinical survey has yielded.

TABLE VI.

Total cases	103
Aneurysm, thoracic	9
,, abdominal	1
Aortic dilatation	32
Aortic valvular disease	63
Pulmonary dilatation	1
Cardiac pain (transient)	57
Cardiac infarction	1
Ventricular enlargement	80
Ventricular failure	20
Heart-block	3–6
Auricular failure	8–11

It now remains to see whether we can learn from the minute anatomy of these lesions how they are related to each other, and whence they come. The histological data that I propose to embody in the next lecture are derived from a study of 21 hearts, most of which have been subjected to a thorough examination—an examination, that is, of a dozen or more blocks, and of ten or more sections from each block. Three of these hearts were found in the course of that examination to furnish evidence of atheromatous, but not of syphilitic, change. This result deserves to be remembered when it is claimed that the naked-eye appearance of the lesion is a better criterion of its syphilitic origin than clinical evidence can furnish; for in all three hearts the changes resembled those of syphilis and were thought to be syphilitic by experienced observers. In another instance I was inclined to write the heart off as degenerative only and not infected, when I found, in the eighty-sixth section examined, a small granuloma beneath the epicardium covering the left auricle (Fig. 3). This prompted a fresh examination of the aorta, and the characteristic adventitial lesion was found. I ought perhaps to add that in none of the three pseudo-syphilitic cases was there any good clinical ground available for a diagnosis of syphilis; though the Wassermann reaction was strongly positive in a fourth case, that of a man of 67 who died suddenly in a surgical ward, and whose heart presented histological changes as like those of atheroma as of syphilis. Here I accept the verdict of the blood test and interpret the case as one in which the syphilitic attack had ended, leaving ravages which, with the help of the atheromatous process, sufficed to kill the man.

I was stimulated to examine these hearts because I did not find in the literature a completely satisfying answer to several questions. In the first place, why do syphilitic patients so often complain of cardiac pain yet so seldom die of cardiac infarction? Secondly, exactly how does syphilis prepare the endocardial surface for superimposed infections? Thirdly, how is the long gap between primary infection and the onset of cardiac symptoms filled in? Fourthly, what is the nature of the myocardial lesions of syphilis? This last question was prompted by examination of sections from a heart described by C. E. K. Herapath taken from a syphilitic patient with a progressive lesion of auriculo-ventricular conduction in which he found a destruction of the bundle of His so complete, and at the same time so selective, as to remind one irresistibly of system degenerations in the cord.

BIRKENHEAD AND WIRRAL CHILDREN'S HOSPITAL.—Mrs. Paget, wife of the Bishop of Chester, recently opened a new out-patients' department which has cost £15,000. The waiting-hall has been named after the late Mr. W. F. Rogers, of Wallasey, whose bequest provided a third of the cost; the laboratory has been given by Mr. and Mrs. Holttum in memory of their son.

DISTRIBUTION OF RADIATION FROM CLINICAL RADIUM TUBES.

ILLUSTRATED BY PHOTOGRAPHY.

BY S. RUSS, D.Sc.,

PROFESSOR OF PHYSICS IN THE UNIVERSITY OF LONDON, AT THE MIDDLESEX HOSPITAL;

AND

DOROTHY F. CLEPHAN.

(*From the Barnato-Joel Laboratories, the Middlesex Hospital.*)

THE series of photographic tests on radium tube which is the subject of this paper was begun with the idea of obtaining some kind of picture of the distribution of the radiation from tubes arranged in certain simple geometrical patterns.

In cases of malignant disease, the treatment is planned with a view to giving a dose of radiation which does not fall below the necessary minimum for all parts of the growth. The laying out and spacing of the tubes is a matter for careful consideration, and it is generally assumed that the distribution of the radium contained in the tubes is more or less uniform throughout their internal lumen. Auto-photographic pictures are useful in pointing out those parts of the field where inequalities occur in the intensity of radiation resulting from any particular plan. Those illustrated here refer to plans such as might be used for the introduction of radium tubes into breast tumour.

Two schemes were adopted for the photographs illustrated: (*a*) in which the tubes were arranged like spokes in a wheel, and (*b*) in which they were in parallel lines. In Fig. 1, A_1 and A_2 are auto-photographs with the photographic plate parallel to the plane of the tubes at a distance of 7 mm. Schemes A_1 and A_2 were combined, the planes of the tubes being 1·4 cm. apart, and the photograph A_3 was obtained by putting the plate halfway between the two. The effect of the irradiation shown on this plate is far from uniform. In a further set of exposures which are not illustrated here, the photographic plane in each case was 2 cm. from the plane of the radium tubes and the irregularities in density were naturally much less. It is interesting to compare the general result of the one scheme, A_3, with that of the other B_3.

The series B_1, B_2, and B_3 (Fig. 2) was carried out with the photographic plate 7 mm. from the radium tubes, arranged in parallel formation; B_3 is a combination of B_1 and B_2.

Inequalities in Radium Tubes.

Inspection of these photographs shows that the concentration of radium inside the individual tubes is not always uniform. Photographic tests on individual tubes have shown that in some cases it can safely be said that the inequalities in strength of radium along the lumen of the tubes are such as to militate against their proper therapeutic use. For purposes of comparison, an exposure was made of 12 6 cm. radon needles arranged as in scheme A and photograph A_4 (Fig. 3) shows the equality of distribution typical of radon containers.

A few samples of auto-photographs of individual tubes are reproduced in Fig. 4. The drawing on the top left hand side is a scale drawing of the tubes. A is a 6 cm. tube filled with radon; B, C, and D are

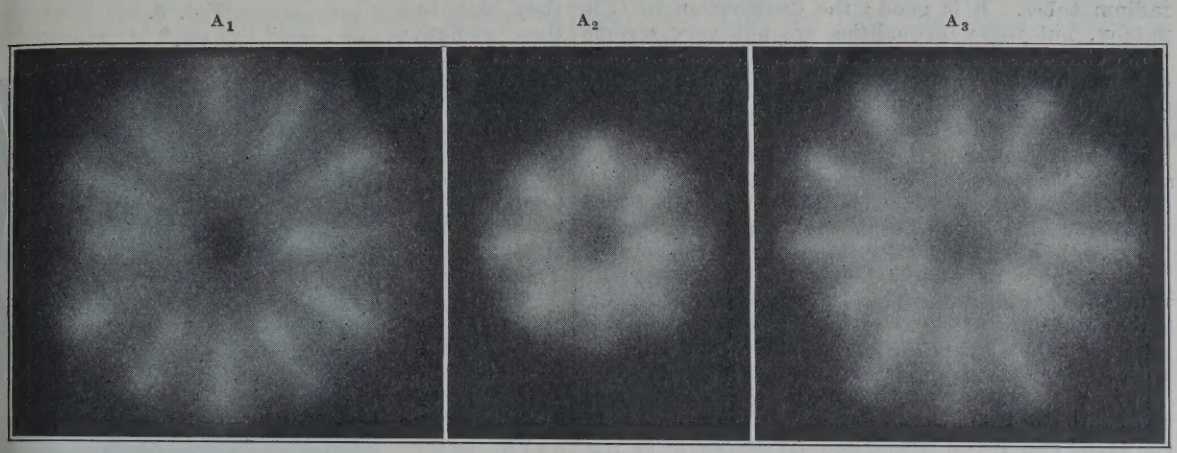
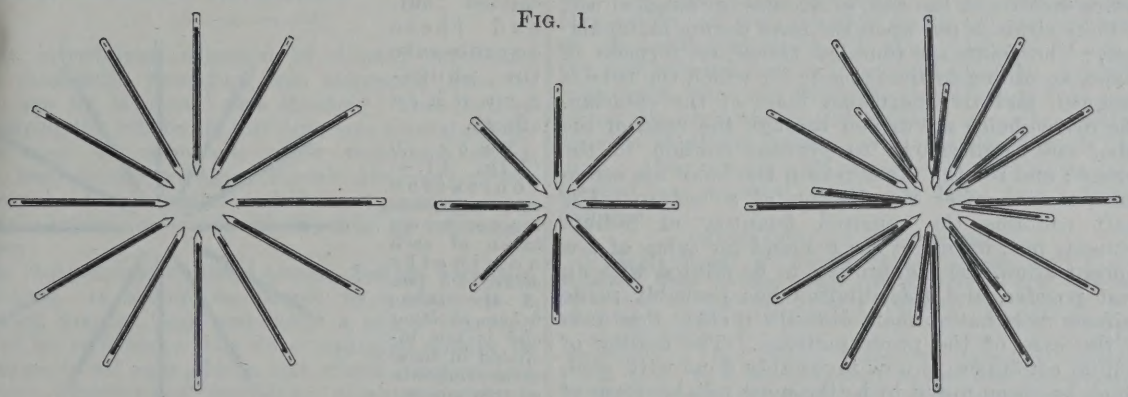


FIG. 1.



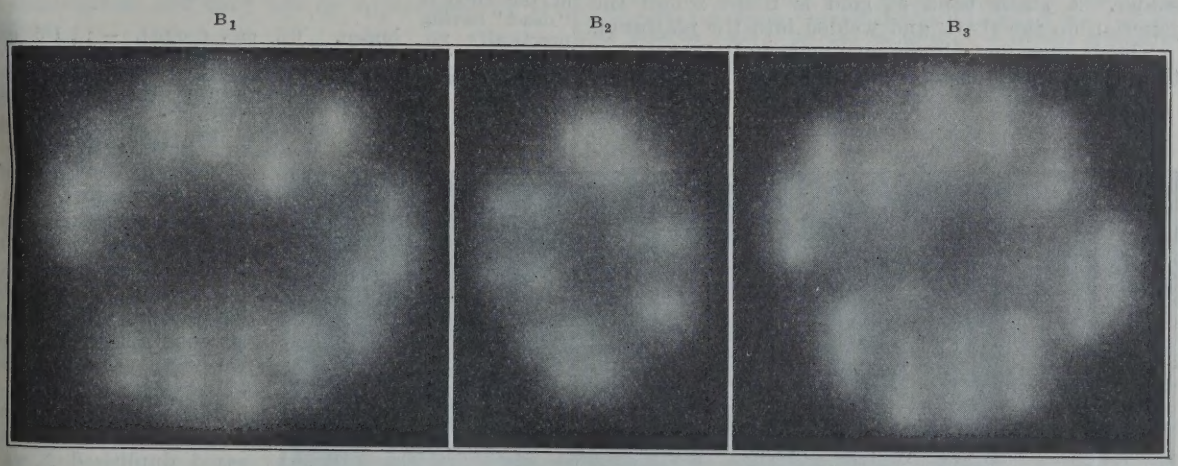
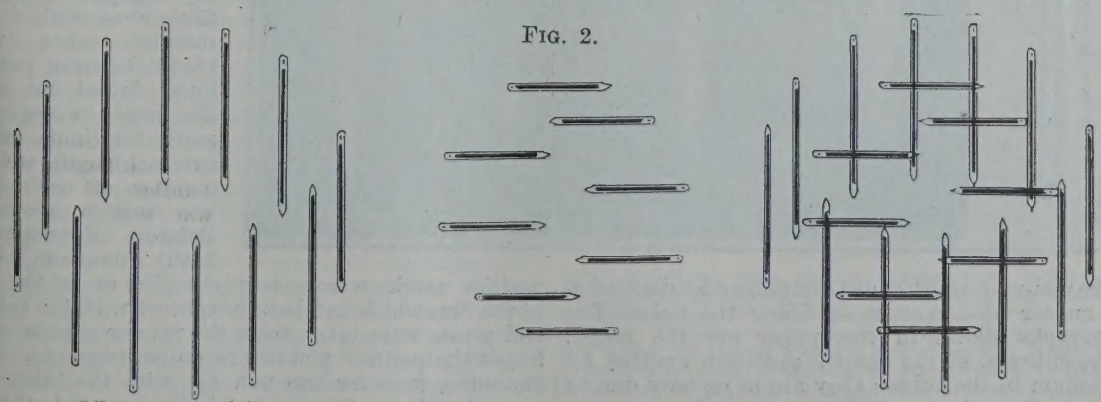


FIG. 2.



radium tubes. B is good; the distribution in C is patchy, but these inequalities are not very serious when the radiation effects at one or two centimetres distance are being considered. C is a badly filled tube, nearly two centimetres out of the six being practically devoid of radium.

The construction of the platinum radium tubes and so-called "needles" is well known, but will, perhaps, bear repetition here. The terms "tube" and "needle" are used somewhat indiscriminately, "needle" being generally applied to the sharp-pointed tubes of narrow lumen and small content which are designed particularly for surgical insertion. Tubes and needles are at present constructed in two parts—a hollow cylindrical shaft, and a separate part with a plug end made either to screw into the shaft or to fit it exactly. The separate part is sometimes the point and sometimes the head end. Filling from the point end of the tube might be judged to be the better method in the case of needles for surgical use, as more strain is put upon the head during manipulation. The points are rounded, trocar, or torpedo in shape, according to the purpose for which the tube is designed, and the individual taste of the clinician. The eyelet holes are drilled through the head of the tube, and countersunk to prevent friction to the thread; and for the same reason the holes are sometimes slotted after the fashion of a bodkin. The shaft contains the required quantity of radium element, but, owing to the demand for tubes of low concentration, the radium has to be diluted with an inert powder, and this dilution has probably made uniform distribution more difficult to effect than it is in the case of the purer material. The sealing of radium containers is now invariably done with gold, which has been found to be the most reliable form of solder. A small band of gold is fitted round the junction on the shaft, and welded into the platinum.

The stopper and plug at one end, and the point at the other, make some "dead space" inevitable; they due to the radium salt shifting about inside the tube. The exposures of the photographs have been such as to bring out clearly any irregularities in filling.

Ionisation measurements of different sections of certain tubes have been carried out, and these corroborate the photographic effects.

Tube D (Fig. 4).—Ionisation measurements have been taken of each nominally active 1·5 cm. of the tube; 0·7 cm. at either end is not included in these measurements as this amount of the tube is "dead" having practically no lumen. 0·7 cm. (point), —; 1·5 cm (next to point), 13 per cent.; 1·5 cm. (middle o tube), 47 per cent.; 1·5 cm. (next to eyelet end), 40 pe cent.; 0·7 cm. (eyele end), —.

FIG. 3.

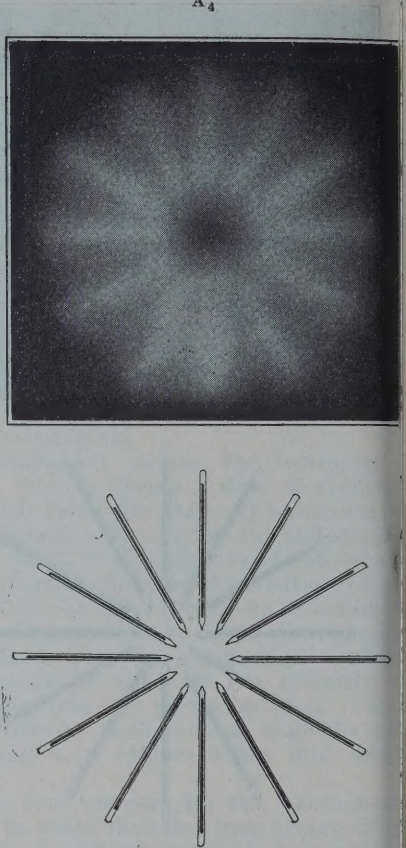
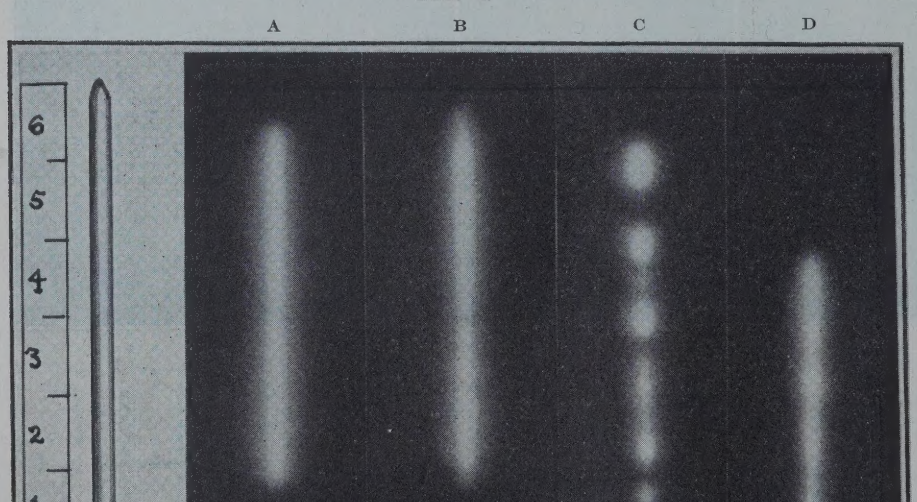


FIG. 4.



Method of Test.

Radium centres may wish to reassure themselves about their own radium tubes. Photographic tests are comparatively simple to carry out, but a brief account of the method we have used may be of service.

For the individual tubes ¼-plate special rapid duplitised X ray films were used. The radium tubes were placed between parallel lines plotted out upon the paper wrapper to mark the limits of the external length, and the number of each tube was written above it. Before development both numbers and position marks were carefully copied on to the side of the film which had been in contact with the tubes and prints were taken from the reverse side in order to get the positive pictures in proper sequence. The exposures were for two minutes, with the tubes laid upon the films. The geometrically arranged schemes

but the non-uniformity of distribution under discussion is a matter of technique in filling the tubes. The photographs shown in this paper are the result, almost entirely, of the gamma radiation emitted by the radium in the tubes; they are in no way due to contamination of the outside of the tubes, nor are

A and B were taken upon X ray plates at the distances specified in the text, the exposures being 15 minutes. Development of films and plates was carried out with Metol Hydroquinine developer at a temperature of about 18° C., for five minutes in all cases. A standard exposure and development was also given for the prints.

Purchasers of radium may find it necessary in the future to insist upon guarantees relating to the distribution of the radium in tubes, as well as certificates of purity and quantity.

THE INTRADERMAL TUBERCULIN TEST.

By James Maxwell, M.D., M.R.C.P. Lond.,

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The intradermal injection of diluted tuberculin as a diagnostic procedure was suggested over 20 years ago by Mantoux[1] and Mendel.[2] This method of applying the tuberculin test possesses several advantages over the numerous other variations which have been employed since Koch's discovery of the properties of tuberculin, and it is becoming more widely adopted, especially in the field of veterinary surgery.

The ideal skin test should possess certain essential attributes. It should be simple to perform in a standard manner, and preferably a single injection should be sufficient; the dose employed should be the same in all cases, for a test which involves two or more injections of increasing doses at intervals is cumbersome and may not be appreciated by the patient.

The result should be easy to interpret and must not be harmful to the patient, either on account of the size of the local response or owing to severe general reaction. In addition, the result should convey some clear indication of disease or of its absence; a test which yields positive reactions in a large proportion of healthy adults is of little assistance in clinical diagnosis. The intradermal tuberculin reaction is clearly capable of fulfilling some of these requirements when employed under favourable conditions; in each case an exact quantity of tuberculin can be injected with certainty into the deeper layers of the skin so that the resultant reactions in a series of cases are strictly comparable, and the extent and significance of the reaction can be assessed with a considerable degree of certainty. It remains to consider whether the results have a definite diagnostic value and whether the reactions are likely to prove in any way harmful.

During the past two years I have been engaged upon a clinical investigation of lymphadenoma at St. Bartholomew's Hospital under the direction of the Rose Lymphadenoma Research Committee.

Some observers have considered that lymphadenoma is really an atypical variety of tuberculosis affecting chiefly the lymphatic glands, and, although the evidence in support of this view is not convincing, it was thought desirable to test a series of patients suffering from this disease by means of the tuberculin reaction, in order to obtain further evidence for or against the theory. After some preliminary comparison of the merits of the various possible methods, the intradermal method was selected for its simplicity. In addition to cases of lymphadenoma, tests were performed on cases of proved tuberculosis and cases apparently quite free from tuberculous infection, in order to control the results obtained in the series under observation. The object of this paper is to place on record a satisfactory method of performing the test, together with a discussion of the results.

Technique.

In performing the test, the following essentials must be kept in mind. In the first place the quantity of material injected must be sufficient to give positive reactions where such reactions should occur, yet it should not be so great as ever to cause severe reactions. The diluted tuberculin is apt to deteriorate, and for this reason it is preferable that the dilutions should be freshly prepared before use. Lyle Cummins[3] gives three weeks as the maximum length of time after which the diluted fluid should not be used, but in the present series the diluted tuberculin was never kept for more than 48 hours, thus ensuring the elimination of any possible factor of deterioration in the standardisation of the reactions. Lastly, the site selected for the injection should be carefully considered, not only from the point of view of ease of injection but also in order that a strongly positive reaction shall not interfere with the functions of the limb. After considerable preliminary work a standard method was evolved which has since been rigidly followed.

PREPARATION OF THE MATERIAL.

A single batch of Koch's old tuberculin (O.T.) was obtained from Messrs. Allen and Hanburys, and this has been used throughout. When required, 0·1 c.cm. of this material is diluted with sterile normal saline solution to a concentration of 1 part in 1000 of fluid. Each cubic centimetre of the diluted tuberculin therefore contains 1 mg. O.T. It is not necessary to add any preservative if the dilution is always carried out shortly before the injection is made; indeed, in a test of this nature it is unwise to introduce any foreign material which might of itself cause the skin to react. At the same time a similar quantity of the control solution, supplied by the same firm, is diluted in exactly the same way, and two tuberculin syringes with ordinary intradermal needles are sterilised by boiling. This procedure naturally produces some degree of blunting of the points of the needles, but as far as intradermal work is concerned, this is rather an advantage, as the points are less likely to slip through the skin into the subcutaneous tissues, a mishap particularly to be avoided in performing the test.

INJECTION INTO THE PATIENT.

The dose eventually selected as the best and consequently standardised was 0·1 c.cm. of the 1 in 1000 dilution, equivalent to 0·1 mg. O.T. Greater doses were injected in some of the earlier cases, but the resultant reactions were apt to be unduly severe, while lesser doses were frequently found to produce equivocal responses. The most suitable site for the injection is the palmar surface of the forearm, midway between the elbow and the wrist. It is accessible and the skin is fairly thick and easily immobilised. Injection of tuberculin in the region of the elbow-joint should be avoided. Occasionally quite severe reactions were obtained even with 0·1 mg. O.T., but in no case was any inconvenience caused to a patient. The control solution should be injected at least 2 in. on the proximal side of the tuberculin injection. This procedure must always be carried out; in two cases out of the 374 recorded here, a false positive reaction occurred.

Both materials are injected into the deeper part of the skin, raising a small wheal which disappears within half an hour. Care must be taken to avoid leakage of tuberculin into the subcutaneous tissues, as unexpected temperature reactions may develop in tuberculous patients if this should occur. The actual technique of the injection differs in no respect from that of intracutaneous injections in general.

THE REACTION.

The reactions were always examined 48 hours after the injection had been given, as it was found that the maximum change had occurred at this period in the majority of cases. On three occasions, however, a positive reaction was found to appear between the third and sixth days. A positive reaction occurred in two controls, consisting in each of an area of erythema about 1 cm. in diameter.

The tuberculin reaction in one of these cases was precisely similar, and there was no reason to suspect tuberculosis from the clinical examination. In the other case the tuberculin reaction yielded the typical positive result in a case of proven tuberculosis. In the remaining 372 cases the control was entirely negative.

The typical tuberculin reaction possesses two distinct features: in the centre of the lesion there is a pale, round or oval area of swelling, palpable to the finger and frequently tender, and surrounding this there is usually an area of erythema. The relative sizes of these two features vary considerably in different cases. In strongly positive reactions there may also be some local irritation of the skin, but general reactions with rise of temperature were only observed in three cases, in which there was consequently a suspicion that there had been a subcutaneous leakage of tuberculin. Separate notes were taken of the extent of the areas of swelling and erythema. It was found that in some cases they were dissociated, either occuring without the other, and the cases in which this phenomenon was noted were studied further. It was then discovered that whereas a simple erythema without swelling was associated with cases which were either doubtful or apparently non-tuberculous, swelling without erythema, on the few occasions on which it occurred, was almost invariably associated with proven tuberculosis. The importance of this point in reading a reaction is obvious. Attention must be paid only to the area of swelling and erythema alone should be disregarded. As has already been mentioned, the two positive control reactions consisted of an area of erythema only, and thus the essential element of a positive tuberculin reaction was absent. The estimation of the degree of the reaction is rather arbitrary, but an area of swelling less than 1 cm. in diameter is reported as "weak positive"; between 1 and 2 cm. is the usual result and may be classed as "positive." Any reaction in excess of this is rare, but may be classed as "strongly positive."

Results.

The results have been classified in accordance with the clinical conditions. A large number of cases was also tested in which the presence or absence of tuberculosis could not be satisfactorily determined, and these cases have accordingly been excluded from consideration.

Group 1 consists of cases of proven tuberculosis. In all the cases of this group either tubercle bacilli were demonstrated or at least typical giant-cell systems were present in sections. The cases may be further subdivided as follows:—

(1) Chronic pulmonary tuberculosis: of 54 cases tested, 49 yielded positive and 5 negative reactions.

(2) Acute tuberculosis: in this condition the intradermal test is usually negative. There were five cases in this group and one reaction was weak positive, the remaining four being negative. One of these cases was quite instructive. The test was performed on a girl aged 6, who was suspected to be suffering from tuberculous mediastinal glands and the result was positive. Two months later the patient was readmitted with tuberculous meningitis and, on repetition of the test, a negative result was obtained.

(3) Tuberculous infection of lymphatic glands: 15 cases were tested and all gave positive reactions. It was in this group that the most marked reactions were obtained.

(4) Tuberculosis elsewhere in the body: of seven cases tested, six gave positive reactions and one a negative.

The total number of proven cases of chronic tuberculosis tested was therefore 76, and a positive reaction was obtained in 70 cases, equivalent to 92·1 per cent. of the total.

Group 2 consists of cases which were almost certainly tuberculous yet in which the final proof was lacking. In this group are classed cases of pleurisy with effusion, cases diagnosed clinically as tuberculous peritonitis, and a few cases of bone and joint disease. Of the 58 cases tested, 51 gave a positive and 7 a negative reaction.

Group 3 consists of cases in which no evidence of tuberculosis could be found. This group is the most difficult to select, for it is almost impossible to be sure that there is no tuberculous lesion in the body even on careful post-mortem examination. The cases consisted of apparently healthy individuals and cases of malignant disease, bronchiectasis, disease of the blood-forming organs, and other cases in which the presence of tuberculosis could be reasonably excluded. In this control series of 189 cases, 59 yielded positive and 130 negative reactions; it should be noted that the cases in this group were mostly adults. In this series of apparently non-tuberculous cases, therefore, only 31·2 per cent. yielded a positive result.

Group 4 consists of the cases of lymphadenoma which were the main object of the investigation. Forty-two patients were tested, and of these 7 gave positive and 35 negative reactions. In three of the positive cases and one negative case there was evidence of the coexistence of a tuberculous lesion. Apparently, therefore, if any significance is to be attached to the test at all, the tubercle bacillus plays no part in the causation of lymphadenoma.

Four additional cases, not included in the groups considered above, were tested. Each showed X ray evidence of calcification in lymphatic glands which appeared to be presumptive evidence of a healed tuberculosis, and none showed any evidence of activity. In three the reaction was quite negative whereas in one, clinically identical with the others, the reaction was strongly positive.

Discussion and Conclusions.

The object of this paper is to describe a standard technique for the intradermal tuberculin reaction and to consider the diagnostic value of the test. The prognostic significance depends upon a number of complicated factors which cannot be considered here except in so far as they have a bearing on the actual result of the test. In proved chronic tuberculosis the test is usually positive, whereas in apparently non-tuberculous cases the percentage of positive results is considerably smaller. The results of Cummins[3] suggest, however, that where the body is reacting well to the toxin and overcoming the infection, the skin reaction may be weak or even negative, and this is supported by the negative reaction found in cases of apparently healed tuberculosis. It must be understood, however, that the size of the reaction is no sure guide to the activity or otherwise of the lesion and that, on the whole, the more severe cases, whose resistance is broken down, also tend to show little or no reaction. The significance of the delayed reaction is also not clear; it occurred twice in cases of lymphadenoma with no evidence of tuberculosis and once in a case of chronic pulmonary tubercuolsis with apparently good resistance. A positive result does not, of course, prove that the particular disease under investigation is necessarily tuberculous, for there is nothing to prevent a small hidden tuberculous focus coexisting with some more obvious lesion which is non-tuberculous.

The significance of the two elements commonly found in the positive reaction is obscure. It seems probable that the area of swelling is an anaphylactic phenomenon and therefore the result of a previous sensitisation to the toxins of the tubercle bacillus.

The area of erythema is not apparently a specific effect and may possibly be a reaction to the protein derived from the bodies of the tubercle bacilli, as distinct from their toxin; it certainly does not appear to have the same significance as the swelling, and it does not seem impossible that sensitisation should occur to the material of which the tubercle bacillus is composed in the absence of an actual infection by the organism with resultant sensitisation to its toxin. The result of the test, therefore, must be interpreted in conjunction with all the other evidence available. In cases of doubt a positive reaction will be one link in the chain of evidence; a negative reaction is of more value in the exclusion of tuberculosis.

The test by itself, however, does not prove a diagnosis, and failure to realise this fact is responsible for many clinical errors. The test, when employed with proper safeguards, may yield information of value if performed in suitable cases; its indiscriminate use as a mainstay in diagnosis is to be condemned.

In conclusion, I wish to express my thanks to the medical staff of St. Bartholomew's Hospital for their permission to perform the test upon the cases under their care, as well as for the great interest which they have evinced in the results obtained.

References.—1. Mantoux, Ch.: Comp. rend. Acad. des Sci., 1908, cxlvii., 355. 2. Mendel, Felix: Med. Klinik, 1908, iv., 02. 3. Cummins, S. L.: Brit. Med. Jour., 1929, i., 336.

CONTROLLED RECESSION OPERATION

FOR THE TREATMENT OF CONVERGENT STRABISMUS.

By P. Eldon Gorst, M.D. Liverp.,

ON. SURGEON TO ST. PAUL'S EYE HOSPITAL, LIVERPOOL, AND HON. OPHTHALMIC SURGEON TO BIRKENHEAD GENERAL HOSPITAL.

Since Dieffenbach in 1829 divided the internal rectus muscle for the correction of internal strabismus, numerous new methods or modifications have been advocated and indicate the dissatisfaction of ophthalmologists with the available operative techniques. These surgical procedures consist briefly of either tenotomy, a tendon lengthening, or a recession of the internal rectus muscle and a shortening, advancement, or tendon folding of the external rectus muscle, while any of the procedures on the internal muscle may be combined with any on the external muscle.

With any of these operations it is usually easy to put the eyes straight on the operating table, but there is a very definite element of uncertainty as to the ultimate result. It is, however, possible to form a very accurate estimate of the final result of the operation at the end of the first week, when the tendons have adhered to their new sites and the muscles have commenced to adapt themselves to the new conditions of balance. At this time:—

(1) If the eyes are still convergent they will probably: (*a*) remain so if there is full adduction; (*b*) go straight if there is moderate adduction; or (*c*) diverge if adduction is almost absent.

(2) If the eyes are straight they will probably: (*a*) remain so if there is full adduction; or (*b*) diverge if there is poor adduction.

(3) If the eyes are divergent this condition will probably increase, especially if the adduction is defective.

The fear of producing a paralytic divergence, owing to failure of the divided rectus to reattach itself to the globe, has made common the practice of under-correction on the operating table. In the operation I am about to describe, paralytic divergence is, for practical purposes, an impossibility, and it is easy to make secondary adjustments at the end of the first week—i.e., at the time when one is best able to judge what the final result will be.

The Operation.

After anæsthesia has been induced by drops of cocaine and adrenalin and a small injection of novocain and adrenalin at the site of the operation, a speculum is inserted and the patient is requested to abduct the eye. The conjunctiva over the insertion of the internal rectus muscle is picked up with fixation forceps, a vertical incision about 1 cm. long is made, and the conjunctiva is undermined as far as the inner canthus. Tenon's capsule is next opened at the upper and lower borders of the tendon and a strabismus hook passed beneath the tendon. The tendon and the anterior part of the muscle are defined by blunt dissection. A double-armed suture of No. 2 black braided silk is now taken and the needles are passed through the tendon from within outwards, as shown in Fig. 1. The needles are introduced about 3 mm. from the insertion of the muscle, and each takes a bite of about one-third of the breadth of the tendon. (It is usually quicker to use one needle only for this portion of the operation, going first from without in, then across the front of the tendon, and then from within out.)

Fig 1.

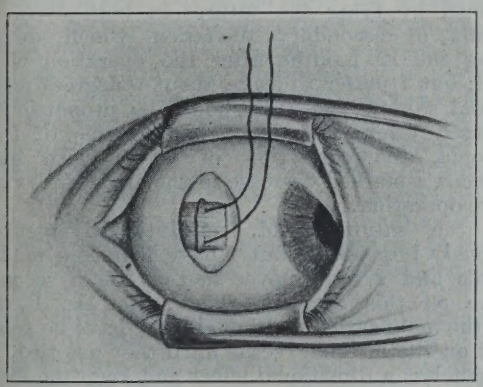
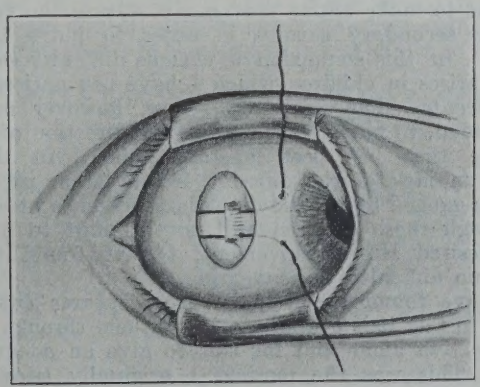


Fig. 2.



The hook is now withdrawn; the tendon is held forward by drawing on the sutures, and with a few snips of the scissors is divided about 1 mm. from the globe. The sutures are held by an assistant and a search is made for the lateral insertions, which are divided. The two ends of the suture are now passed through the episcleral tissue beneath the

insertion of the divided tendon and, slightly diverging, are brought out through the conjunctiva close to the limbus (Fig. 2). The conjunctival wound is carefully closed with two or three sutures of No. 0 silk. The long ends of the sutures are tied together, wrapped round a piece of lint, and fixed to the forehead with strapping.

The eye is lightly closed with a pad and strapping during the first 24 hours, but after that the dressings are removed during the day, though a pad is strapped on during sleep to prevent accidental pulling on the sutures. The eye should be irrigated every two or three hours during the day, and mild antiseptic drops, such as colloidal silver, should be instilled, while neoprotosil ointment is freely inserted before sleep. If rigid care is taken to ensure cleanliness by repeated dressings there is very little conjunctival reaction.

Between the fifth and seventh days the case is carefully considered. If the eyes are straight or have about 5 degrees of residual internal squint and there is good adduction, the sutures are removed; but if the eyes are divergent or if there is poor adduction the sutures are tied, the procedure being as follows.

The eye is anæsthetised with cocaine and adrenalin drops and a pledget of cotton-wool soaked in the solution is placed on the globe over the site of the operation and left, or renewed, until the hyperæmic conjunctiva is blanched. While the anæsthetic is acting the sutures are unravelled and cleaned by painting them with weak iodine. When anæsthesia is complete, the small sutures uniting the conjunctival wound are removed and the first double turn of a surgical knot is tied on the main sutures. This knot is gradually tightened, the effect being noticed between each tightening until the desired effect is produced, when the knot is completed. This suture should be removed at the end of a further five days. When both eyes have been operated upon, the secondary suture is, of course, first tied on the eye which possesses the poorest adduction.

The operation presents no difficulties, and can be performed on comparatively young children (from 10 years upwards) with only those difficulties inseparably connected with their varying temperaments. It is not a suitable operation to perform under general anæsthesia, as it is necessary for the patient to make active movements during the tying of the secondary sutures in order to judge their effect. In this connexion a curious difficulty sometimes arises in children which I have not noticed in adolescents. Some children refuse, however much persuaded, to move their eyes in the direction of the muscle that has been operated upon. In these cases an idea of the amount of adduction present can be gauged by the amount of convergence present. Although these children will not attempt to make the desired lateral movement, I have found they have no difficulty in converging.

I have found no difficulty from sutures cutting out; in fact it is possible to insert them through the conjunctiva alone and for this to give an adequate hold. This was the method I originally adopted, inserting the sutures after the method of the Richard Williams advancement operation. I found that at the end of a week the conjunctiva was so firmly adherent that it completely failed to come down and left the suture in direct contact with the cornea; this method had therefore to be abandoned.

The operation can be combined with any operation on the external rectus of the same eye if the tenotomy alone is insufficient to correct the squint, but I much prefer to repeat the operation on the second eye. If the entire correction of a high degree of internal squint is to be borne by one eye only, the new insertion of the internal rectus must be so far back that poor adduction and divergence are likely to ensue. With this operation it is the diliberate policy moderately to over-correct the squint upon the operating table. If the squint is 15 degrees to 18 degrees or under, an operation on one eye will usually suffice, but if the squint is over 18 degrees it will be necessary to operate on both eyes. The complete division of both internal recti will over-correct most internal squints.

A difficulty arises in moderate squints which are under-corrected by a single tenotomy and heavily over-corrected by a double tenotomy. I find the best method with these cases is to do the full operation on one eye and to allow a moderate recession of the other internal rectus. This can easily be brought about by immediately tying the suture of one eye. The suture is tied in the way already described, the first turn of the surgical knot being tightened until only the desired amount of over-correction is present, when the knot is completed.

The Secondary Sutures.

When the sutures are tied on the seventh day the maximum amount of secondary correction obtainable cannot be definitely stated, but I think it is from 7 degrees to 10 degrees in each eye. I find it is usual for a slightly greater correction to be manifest on the day after tying the secondary suture than when the patient is on the table. While it is possible to obtain a correction of this amount on the seventh day, a much greater amount can be obtained by tying the secondary suture on the fifth day. In young patients—that is to say, from 10 to 16 years old—it is safer to tie the secondary suture on the fifth day if there is much over-correction present. In these cases union between the divided tendon and the globe often takes place more rapidly than in older patients, and I have once or twice been disappointed in the amount of secondary correction that I have been able to obtain. This, however, was before I adopted the practice of immediately tying the main suture if marked over-correction followed the tenotomy. In one case, which was inadvertently left for two weeks, no result was obtained by tying the sutures in both eyes. The amount of secondary deviation which develops during the 12 months after the operation is very slight, but I prefer to leave about 5 degrees residual internal squint, and this should be proportionately increased where there is a high degree of hypermetropia, the correction of which with glasses produced a marked decrease in the angle of deviation before operation.

If the sutures hold, paralytic divergence is obviously impossible, but I have found no tendency to this and I have never had to tie a secondary suture on this account. The reason is, I think, that the main sutures, although they have no traction effect on the internal rectus until they are tied, have nevertheless a directional effect and keep the divided tendon applied to the globe. None of the cases I have yet operated upon have shown any tendency to divergence, but that a small percentage will do so seems inevitable when we remember that it is not uncommon for internal squints to straighten themselves even after 20 years of age, and sometimes even to go on to divergence without operative interference.

It is obvious that those cases which become straight naturally would have become divergent whatever operation had been undertaken. It seems

absurd deliberately to under-correct at the first operation with the intention of probably doing a second operation of a similar nature at a later date, when it is no more difficult to readvance a well-united internal rectus, if subsequent divergence should make this necessary. If the internal rectus is well united and there is good adduction, this should only be necessary in that very small percentage of cases that would have become straight without operation.

Paralytic divergence, through failure of the divided rectus to reunite with the globe, is of course a very different matter, owing to the great difficulty of correcting it by operation; it must be regarded as a surgical disaster.

The most, I think, that we can expect of any squint operation is that in every case it will enable us fully to correct the strabismus and yet leave the eyes with a practically full range of mobility. I have performed this operation on 126 cases and, with the exceptions mentioned, have always been able to obtain this result.

THE CAUSES OF DEATH AMONGST DIABETICS.

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With the introduction of modern methods of dietary control and the use of insulin for suitable cases, the outlook of the diabetic has been totally changed. It is sometimes said that under efficient treatment the prognosis is so improved that the patient's expectation of life is as good as that of a normal individual. For the majority of diabetics this may be so, but the occasional occurrence of unexpected deaths raises the question of how far the general statement is true. It is too early yet to answer the question from national statistics [4] for, as has been pointed out, improved treatment will enable many sufferers to live longer. The incidence of diabetes is stated to be increasing, but this increase may be more apparent than real, and may in part be due to the increased interest which has been directed to the subject in the last few years. It has been suggested that a proportion of diabetic deaths are avoidable and should not occur under modern conditions.[1] The present investigation has been undertaken to examine the question and to find out the dangers which face the diabetic.[5]

The deaths reported in this paper are taken from a clinic of about 2000 cases of diabetes mellitus. For several reasons it is not possible to work out a death-rate for these cases. An attempt is made to keep in touch with all diabetics who have been seen in the clinic in order to ensure that they remain sugar-free at all times, and so to prevent recurrence of symptoms or the development of complications. It is hoped also that information of prognostic value may be collected in this way. In spite of this follow-up service, and even with the help of an efficient social service department, it is difficult to keep track of all the patients. Some go off diet, feel comparatively well for a time, and return later with their original symptoms fully developed. Others cannot be traced; undoubtedly a number of these have died. Such elements of uncertainty make statistical investigation difficult. Sufficient information on the causes of death has been collected for 150 cases, and an analysis of this material is presented below. A few of the patients died in hospital within a short time of admission. About half were in-patients for a time, and the others were only seen at the clinic as out-patients. The majority of deaths occurred at the patients' homes or in some other institution.

Effect of Age, Sex, and Habit.

A superficial survey of the causes of death shows that they may be grouped as follows: (*a*) cardio-vascular conditions, 43 (28·7 per cent.); (*b*) infections, 37 (24·7 per cent.); (*c*) improper treatment, 21 (14·0 per cent.); (*d*) cancer, 13 (8·7 per cent.); (*e*) tuberculosis, 11 (7·3 per cent.); (*f*) acute non-surgical abdominal conditions, 9 (6 per cent.); (*g*) miscellaneous, 16 (10·6 per cent). Coma in itself is not to be regarded as a primary cause of death but rather as a contributory complication. Fifty-nine cases (39·3 per cent.) developed acidosis and died in coma; the majority did not show this symptom.

The *age* at death ranged from 8 to 74, 68 per cent. of the cases being over 45 years of age. The return of the Registrar-General for 1927 shows that in Scotland 81·2 per cent. of diabetics who died were over 45, as compared with 63·3 per cent. of deaths from other causes. Joslin [2] has found the same thing in his cases, and points out that diabetes is very largely a disease of advanced life; indeed, the average age at death of his latest group of diabetics is actually three years later than that of the average citizen in the same district.[3] A striking feature in our series is the remarkably small number of young cases, only 14 being under the age of 25. This is probably accounted for by the readiness with which young patients respond to treatment by insulin. The age at death appears to have a considerable influence on the question of whether coma will occur or not. For our whole series the average age at death was 50·5 years, while for the coma cases it was 37·4 years, as compared with 59 years for those who did not develop coma. As will be seen in Table II., the average age of death in some of the non-coma groups is considerably higher. Of the 48 cases under 45 years of age, 38 developed coma (64·4 per cent.), while of the 81 patients over this age only 21 died in coma (35·6 per cent.). The influence of age in this respect is well shown in Table I.

Table I.—*Percentage of Deaths due to Coma at Different Age-periods.*

Age-period.	Total deaths.	Coma: deaths and percentage.	Age-period.	Total deaths.	Coma: deaths and percentage.
0–14	2	2 (100·0)	55–64	35	7 (19·4)
15–24	12	11 (91·6)	65–74	35	2 (5·7)
25–34	18	13 (72·2)	75+	5	0
35–44	16	12 (75·0)			
45–54	26	12 (46·2)		150	59 (39·3)

It will be seen that in earlier years practically all cases developed coma before death, while in later life this tendency diminishes and finally disappears. The danger of developing coma is inversely proportional to the age of the patient. A similar observation has been made by Joslin.[1]

Sex.—The series shows a preponderance of females, 86 (57·3 per cent.), to 64 males (42·7 per cent.), a ratio similar to that found in the national statistics (66·9 per cent. to 33·1 per cent.). The excess of females is greater amongst the patients over middle life, and especially amongst those dying of cardio-vascular conditions. The same phenomenon is shown

by the statistics for Greater London quoted by Joslin.[2] The coma cases are practically equally divided—29 males to 30 females.

Habit.—The habit of body during the period of treatment is also of importance in relation to the development of coma. Nineteen cases (12·7 per cent.), 17 of whom were women, were recorded as obese; none of these developed coma. This fact is in keeping with the clinical observations that the fat diabetic only rarely shows acetone in the urine, even when on a low calorie diet. From the nature of the disease it is probable that many of the 54 patients of normal weight had previously been obese. The 77 thin individuals included 39 males and 38 females. Coma developed more frequently (64·4 per cent.) amongst those who were under weight.

Duration and Treatment.

Duration of Disease.—Joslin [1] has suggested that nearly all diabetics who die in the first year of their disease die of coma, and has put this forward as good proof that coma is avoidable. Elsewhere [3] he suggests that diabetes is milder the longer it lasts, though in this statement there is an obvious fallacy. Our figures show that of 54 cases of under two years' duration 51·8 per cent., of 68 between two and five years 35·3 per cent., and of 26 who had had diabetes for more than five years 19·2 per cent. developed coma. the duration of adequate treatment appears to be of little importance.

Type of Treatment.—It is to be expected that the more severe cases requiring insulin would show a higher percentage of deaths and of coma before death, but the matter is complicated by the number of deaths amongst mild diabetics of advanced years. Insulin as well as dietary restriction was required by 72·7 per cent. of all subjects, and the proportions are practically identical in both coma and non-coma cases. On the other hand, the faithfulness of the patient in carrying out instructions is of the greatest importance. In 57 of the patients dietary control was unsatisfactory for some time before death; 20 of these cases were under 45 years, and all except one, who was aged 40, developed coma (95 per cent.), while of those over middle age 12 out of 37 suffered from coma (32·4 per cent.). Improper dieting appears to be very serious for the young but of less consequence among the aged.

Causes of Death.

The cardiovascular group is the largest; no patient in this section was under 45 years and the average age of death was high. Fifteen of these patients died from cerebral hæmorrhage, 11 from heart failure following arterio-sclerosis, and 8 after gangrene. The heart failure cases include only two in which the cardiac disease was of long standing. The common factor in this group is vascular degeneration, which was also prominent amongst the other non-coma cases. In a series of post-mortems on 51 diabetic subjects, Wilder [7] reports a high incidence of arterio-sclerosis (71·4 per cent.) and of renal damage. Joslin [3] points out that, as the occurrence of fatal coma is reduced by improved treatment, there is a steady increase of cardiovascular and renal deaths.

Malignant disease accounted for 13 deaths and none of these patients showed coma. Cancer of the head of the pancreas was confirmed by post-mortem examination in two cases, and in two others who died jaundiced a similar diagnosis was made. One patient after a long history of atrophic cirrhosis developed a nodular enlargement of the liver, which was diagnosed as a primary cancer. Another patient on whom a post-mortem was performed was found to have a cancer of the pylorus affecting neither the liver nor the pancreas. A diagnosis of cancer of the stomach was made in two cases, and of the colon (one case), and of the uterus (one case), but there was no opportunity for confirming these diagnoses. In addition, there was one example of carcinoma of the tongue, one sarcoma of the jaw, and one cancer of the cervix. Thus in most cases the malignant disease was probably unrelated to the diabetes. It is to be expected, of course, that a group of people of this age-distribution would show a number of deaths from cancer. One individual who died from gangrene also suffered from scirrhus of the breast.

Sepsis of various kinds, other than gangrene, is given as the immediate cause of death in 37 cases (18 males, 19 females), of whom 20 developed coma before death (54 per cent.). The importance of age in relation to this question is shown by the following figures. Under 35 years of age, 90 per cent. of the septic cases developed coma; between 35 and 65 the proportions are about equal (coma in 55·6 per cent.); while in 9 cases over that age coma was absent.

Phthisis (ten cases) and Pott's disease (one case) caused 7·3 per cent. of the deaths. It is interesting to note that the average age of death in this group was 55·4 years, and that only one of these cases was below 40, although tuberculosis used to be considered the scourge of the young diabetic. Coma was absent in this group. Miscellaneous causes of non-coma deaths include pernicious anæmia (two cases); peptic ulcer with fatal hæmatemesis (two cases); hæmochromatosis (one case); and accident (one case).

Breaking diet, inability to take food, or failure of the insulin supply, led directly to 21 deaths from diabetic coma (13 males, 8 females). Nine of these patients were over 45.

TABLE II.—*150 Diabetic Deaths.*

A. Non-coma Deaths (91).

Cause of death.	Cases.	Percentage of all deaths	Average age.
Senility	8	5·3	73·4
Gangrene	8	5·3	66·0
Arterio-sclerosis and heart failure	11	7·3	63·7*
Cerebral hæmorrhage	15	10·0	61·8
Chronic nephritis	1	0·7	57·0
All cardiovascular	43	28·6	65·1
Respiratory infections	9	6·0	59·5†
Acute abdominal sepsis	4	2·7	59·5‡
Septicæmia	2	1·3	70·0
Erysipelas	1	0·7	38·0
Cellulitis	1	0·7	26·0
All sepsis (non-coma)	17	11·4	57·5
Tuberculosis	11	7·3	55·4
Malignant disease	13	8·7	59·5
Pernicious anæmia	2	1·3	43·0
Peptic ulcer—hæmatemesis	2	1·3	36·5§
Acromegaly	1	0·7	62·0¶
Hæmochromatosis	1	0·7	27·0
Accident	1	0·7	30·0
Total non-coma	91	60·7	59·0

B. Coma Deaths (59).

Breaking diet	21	14·0	38·4
Gastro-intestinal upset	9	6·0	36·9
Focal sepsis	7	13·3	36·0
Respiratory infections	13		40·7
Hæmatemesis	1	0·7	25
Unspecified coma	8	5·3	32·7
Total coma	59	39·3	37·4
All deaths	150	100	50·5

* 1 myxœdema. † 1 with parotitis; 1 acromegaly.
‡ 2 appendicitis; 2 peritonitis. § 1 with carbuncle.
¶ 1 also died of influenza.

Deaths from coma followed non-surgical *gastro-intestinal upset* in nine cases. In all but one of these the preceding treatment had been entirely satisfactory. The fatal illness in these cases came on suddenly and was of short duration. It was characterised by nausea and persistent vomiting, usually accompanied b

ntense abdominal pain and sometimes by diarrhœa. Symptoms of this sort may occur as the result of ketosis in diabetes, but in these cases we believe that the gastro-enteritis preceded the onset of the coma. In a further group of eight cases coma is given as the cause of death without mention of any precipitating factor.

Amongst the 150 fatal cases there were a number in which other ductless glands were involved besides the pancreas. There were two cases of acromegaly (aged 53 and 62) and one of myxœdema (aged 59), none of whom developed coma. Four patients who also suffered from hyperthyroidism appear amongst the deaths from coma, two as the result of respiratory infections, one from breaking diet, and one not specified. They were aged 30, 35, 37, and 40.

Discussion.

Diabetes mellitus should be regarded as a symptom-complex rather than as a single disease, since it is probable that it may be produced by several different pathological processes. The figures just examined suggest that a diagnosis of "diabetes" covers at least two distinct conditions, an impression which has also been formed in the clinic. The two types may almost be distinguished by the age of onset of the symptoms. The young cases often give a history of some immediately preceding infective process, with a rapid development of symptoms. The initial disturbance may be considerable and the disease appear severe, yet under satisfactory conditions a good deal of recovery is often possible. Although favourable when properly managed, these cases require careful supervision in order to avoid trouble. It is essential for them to follow a strict régime, for the dangers of relaxation of effort are greater in them than in diabetics over middle life. Sepsis, gastro-intestinal upset, and major errors of dieting, all tending to development of acidosis, are the dangers especially to be feared. Acetonuria and coma are readily produced in this type of case, but should be absent under adequate treatment or, where developed, should be controlled by insulin, death being thereby avoided. In this "toxic" type the patients may be somewhat under weight, but are usually otherwise healthy. Degenerative processes are absent and there is no history of obesity. The sex-incidence is about equal in patients under the age of 45 (26 males, 22 females), as we have already shown in the thin subjects and those dying of coma.

The second group of diabetics is distinguished from the first in several ways. As a whole, the patients are older; indeed, many might be regarded as long-lived. The diabetes of later life has long been recognised as mild in type and little liable to the complications found in younger cases. Usually it appears insidiously, the first sign being gangrene, eye trouble, or pruritus. The progress of the disease is slow and there is little tendency to acidosis. Amongst the outstanding features of this group are the prevalence of arterio-sclerosis, the occurrence of obesity, and the preponderance of females. The grossly overweight individual is commonly regarded as a potential diabetic,[3] [6] and it may be that the metabolic disturbance which leads to obesity is closely related to that in diabetes. This form of obesity is more common in women and leads to high blood pressure and often to arterial damage. The high incidence of arterio-sclerosis in diabetes is usually regarded as evidence that it depends on the metabolic disturbance, but it is equally possible that the relationship is just the reverse. From a study of this type of diabetes it is our impression that the insidiously progressive vascular disease occurs first and leads to pancreatic degeneration in much the same way as it affects the kidneys. The mildness of this type may in some degree be due to the slower development of the lesion and to a gradual adjustment of the body to the altered conditions. Patients who suffer from this "degenerative" type of diabetes do not die from coma but from some other cause, often vascular. Like the other group, however, these patients also show a lowered resistance to infections, and under the influence of these the diabetes may become more prominent.

It will be observed that amongst the non-coma deaths there are a few who do not conform to the "degenerative" type. These include the patients who died of erysipelas (aged 38), cellulitis (26), hæmatemesis (29 and 44), one pernicious anæmia (29), the accident case (30), and possibly also the hæmochromatosis (27). In some of these cases death probably occurred too rapidly to allow the development of coma. When allowance is made for these cases, the average age of death of the non-coma patients is raised from 59·0 to 62·1 years.

Summary.

An analysis has been made of the cause of death in 150 cases of diabetes mellitus. Coma preceded death in 59 of the cases, being precipitated by sepsis, abdominal upset, or by faulty treatment. Deaths without coma were mainly due to cardiovascular lesions, to sepsis, to tuberculosis, and to malignant disease not necessarily involving the pancreas. The investigation suggests that the cases of diabetes may be grouped into two classes: (*a*) the "toxic" type in younger individuals with a tendency to develop coma; (*b*) a "degenerative" type, characterised by greater age, arterio-sclerosis, and a tendency to obesity. Treatment should be rigidly followed by all subjects under middle age in order to avoid the danger of acidosis. This danger is of lesser importance for the older diabetic, but in his case attention should be specially directed to the vascular system.

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GLASGOW WESTERN INFIRMARY.—It is reported that upon a total expenditure last year of £90,783 there was a surplus of £3634. The average stay of each patient (12,521) was 18·18 days; in 1928 it was 20·05. In the David Elder Infirmary it was 19·96. The average cost per patient was £6 14*s.* 8*d.*, as compared with £7 18*s.* 3*d.* in the previous year. It is still impossible to proceed with the ophthalmic department, for which the money is in hand, in consequence of the continuance of the Rent Restrictions Act, the site being occupied by tenement houses belonging to the infirmary. The new X ray and electrical department, a section of which will be set apart for radium treatment, is nearing completion.

PROPOSED EXTENSION OF MOORFIELDS EYE HOSPITAL.—It has long been desired to enlarge the out-patient department of the London Ophthalmic Hospital, City-road, E.C., but space has been lacking. An opportunity now occurs of purchasing the adjoining cocoa factory, which would not only provide the means of extending this department, which deals with an average of 480 patients daily, but would afford additional scope for the post-graduate school, larger laboratories, the extension of research facilities, and a larger physico-therapeutic department. The purchase price of the factory is £4000, towards which £1200 is available, and the Lord Mayor, the vice-president, and Mr. T. W. Luling, the chairman, are appealing for the balance.

CLINICAL AND LABORATORY NOTES

INTERSTITIAL PREGNANCY IN A TUBAL STUMP

AFTER SALPINGO-OÖPHORECTOMY.

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Interstitial pregnancy is very rare. Werth, operating on 120 cases of ectopic gestation, saw no example of it, and Munro-Kerr saw one in 80 cases. The Johns Hopkins Clinic puts the incidence at 0·65 per cent. Still more uncommon are cases in which pregnancy occurs in the interstitial part of the tube after salpingo-oöphorectomy. After a survey of the literature at my disposal I can find only seven cases in any way comparable to that described here.

DESCRIPTION OF THE CASE.

The patient started to menstruate at the age of 16. Her periods were regular and painless, occurring every four weeks and lasting five days. Her children were 15, 12, and 4 years old. There had been no miscarriages. Five years ago she was operated upon after the rupture of an ectopic gestation. The right Fallopian tube and ovary were removed and she made an uninterrupted recovery. A year later she was delivered of a full-time child.

The last normal menses occurred five weeks before admission to hospital. A week before the patient had noticed a blood-stained discharge per vaginam, lasting only a few hours. The onset of this corresponded with the expected time of her period. For the last 14 days the patient had been aware of an uneasy dragging pain in her right side but had had no acute pain. At 4 P.M. on the day before admission she felt definite epigastric discomfort and nausea. At 7 P.M. she was seized with sudden right-sided pain of sufficient violence to double her up. She went to bed but the pain was severe throughout the night, during which time she vomited twice. At no time was there any loss per vaginam. Next morning she was sent to hospital by ambulance and arrived at 2 P.M.

On admission her temperature was 99° F., her pulse-rate 88, and her respiration-rate 24. She looked well and appeared comfortable. The mucous membranes were not blanched. The tongue was moist but covered with a white fur. The abdomen moved poorly on respiration but showed no rigidity. Hyperæsthesia was marked in the right iliac fossa. On deep palpation tenderness was elicited just above the mid-point of Poupart's ligament on the right side. On examination per rectum and per vaginam the patient complained of tenderness on the right side. Bimanually the uterus was felt to be slightly enlarged. The breasts showed no signs of activity.

On opening the abdomen at 3 P.M. the pelvis was seen to be full of blood, partly clotted and partly fresh and bright. Bearing in mind the previous operation, the left Fallopian tube was immediately palpated but found to be normal. The incision was extended downwards and the uterus brought into view, the whole organ being slightly enlarged. The fundus on the right side was definitely raised (Ruge Simone's sign).* On the upper aspect of the uterus, about a quarter of an inch internal to the point at which the right tube was originally attached, there was a ragged bleeding cavity about a quarter of an inch in diameter. This was at first thought to have been caused by some instrument used to procure abortion, but on carefully mopping the blood from its walls chorionic villi were plainly seen. An effort was made to pass a probe through the hole into the cavity of the uterus, but no communication could be discovered. A small wedge of adjacent uterine musculature was excised and the resulting wound closed with buried sutures of catgut. A search was made for a remnant of ovarian tissue on that side, but none was found. A small corpus luteum cyst was seen in the left ovary. The wound was closed without drainage and the patient made an uninterrupted recovery.

McIntyre,[3] Campbell,[4] and Douglass[5] report very similar cases, interstitial pregnancy occurring in each case in the tubal stump after removal of both tube and ovary. Lesse,[6] Di Palma,[7] and Hofmeier[8] report cases following removal of the tube alone. The *Journal of Obstetrics and Gynæcology*[9] quotes a case in which there is no statement as to whether or not the ovary had been removed along with the tube at the first operation. Nache[10] reports a very interesting case of interstitial pregnancy occurring three months after he had attempted sterilisation of the patient for pulmonary tuberculosis by removing the Fallopian tube on each side, together with a wedge of uterine tissue. Campbell states that in his case the uterine cavity communicated with the ovarian cavity by means of the orifice of the Fallopian tube. Douglass, on the other hand, tried unsuccessfully to pass a probe from the ruptured ovarian cavity into the uterus.

COMMENTARY.

There were several points in this case which made even the diagnosis of a ruptured ectopic gestation uncertain. The pain, although of sudden onset, was preceded for three hours by epigastric pain. The pain was definitely right-sided—that is, on the side on which tube and ovary had previously been removed. The history of a missed period was a doubtful one, and at no time during the attacks of recent pain had there been any vaginal loss. The absence of this last symptom is noted by McIntyre, Leyland Robinson,[11] Vineberg,[12] and others, but its absence is by no means constant. Moreover the patient showed none of the signs of internal hæmorrhage, her pulse rate, for instance, being only 88.

Rupture occurred in the fifth week, although Curtis[13] and others consider that an interstitial pregnancy tends to rupture about four weeks later than one in the Fallopian tube itself. But Waegeli in his masterly paper, La Grossesse Interstitielle, found that out of 38 collected cases,

4	ruptured	during	the	1st month.
11	,,	,,	,,	2nd ,,
9	,,	,,	,,	3rd ,,
7	,,	,,	,,	4th ,,
7	,,	after.		

The age at which rupture occurs seems to depend solely upon the site of implantation of the ovum. If this takes place at either end of the interstitial portion of the tube, rupture will be early; if in the central part, where it will be surrounded by thick muscle, rupture will be late. The assumption in this case is that implantation was at the extreme tubal end.

Waegeli argues at length the question as to whether an interstitial pregnancy develops within the lumen of the tube or in the uterine muscle deep to the mucous membrane. Were growth intracanalicular we should expect, in each case, to find that the ovarian cavity communicated by means of the uterine opening of the Fallopian tube. In those cases in which ovarian and uterine cavities have been found to communicate, Waegeli considers that there has been a rupture of the muscular septum between them rather than a dilatation of the uterine opening of the tube. His microscopical findings support this contention, for in one case he traced the lumen of the interstitial part of the tube and found it complete and separate from the ovarian cavity throughout its length. He concludes that when implantation occurs in the interstitial part of the tube, where the

* Ruge Simone's sign consists in its entirety in noting that with an interstitial pregnancy (1) the fundus on the affected side is raised, (2) asymmetry of the adnexa is present, (3) the round ligament has a lateral insertion into the fœtal sac.

mucous membrane is thin and uncomplicated by folds, the ovum finds itself in direct contact with the uterine musculature, thus differing from uterine implantation where the thick decidua prevents contact with the muscle. It differs, too, from tubal implantation where, owing to the complexity of the folds of the mucous membrane and to a partial decidual reaction, the ovum does not at first come into contact with the muscle itself. On these grounds Waegeli considers that every case of interstitial pregnancy is to be regarded as truly intramural and extracanalicular.

We know nothing of the mechanism of arrest and implantation. In our case there was certainly no ovarian tissue on the right side; therefore the ovum must have come from the opposite side. It may have passed normally down the left Fallopian tube, become fertilised, and entered the uterine orifice of the right tubal stump; this is extremely improbable. It is far more likely that the ovum, originating from the left ovary, crossed the peritoneal cavity and found its way into the right tubal stump, which for some reason had regained its patency. That such regeneration can occur after salpingectomy is proved by the remarkable case reported by Nache.

Again, one can but speculate on the point at which fertilisation occurred. It may have been that the uterine orifice of the right tube had been constricted by previous inflammation so that it would permit the entrance of spermatazoa but not the exit of the fertilised ovum. On the other hand, fertilisation may have taken place either in the interstitial part of the right tube or in the abdominal cavity by spermatazoa which have found their way up the left Fallopian tube. Blacker[15] points out that this is the normal procedure in pregnancy in the rudimentary horn of a bicornuate uterus, in which there is no communication with the cavity of the uterus. It is conceivable that if fertilisation had taken place by this method within the abdominal cavity, the ovum would have grown to such an extent as to inhibit its progress down the narrow interstitial part of the tube. In our case there was nothing in the previous history pointing to such pelvic inflammation as might have been responsible for the partial closure of the uterine orifice of the tube. In the reported cases of interstitial pregnancy the previous histories often tell of febrile abortions and other similar inflammatory troubles. In McIntyre's and Di Palma's cases the tube had previously been removed on account of salpingitis. Hennig[16] has suggested that the mouth of the tube is sealed over by an excessive decidual growth, thus preventing the entrance of the ovum into the uterine cavity. Another possible explanation of interstitial pregnancy is that the ovum becomes embedded in one of the tubular diverticuli of the uterine mucosa. Waegeli, although he noted the presence of such diverticuli in one of his sections, was unable to trace any connexion between them and the ovarian cavity.

My thanks are due to Mr. G. C. F. Robinson, senior surgeon to the South Devon and East Cornwall Hospital, Plymouth, for permission to publish this case and for the opportunity of operating upon it.

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NON-SPINOUS PSOAS ABSCESS.

FOUR CASES AT A CHILDREN'S HOSPITAL.

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THE type of psoas abscess here considered has no origin in the spine and is not tuberculous. This group of abscesses does not appear to be generally recognised and may therefore present difficulties in diagnosis. The cases reported were admitted to the Queen's Hospital for Children during 1929 and three of them were observed by myself. The cases showed a marked similarity and the first may be taken as typical.

CASE 1.—A boy, aged 4½, was sent to the hospital with the diagnosis of acute appendicitis. Five days previously he had been noticed to be feverish and had vomited once. Two days previously he had begun to limp and had complained of pain in the right groin and the right lower abdomen. When he was admitted the temperature was 101° F. The abdomen moved well; tenderness in the right iliac fossa was marked and some fullness could be detected just above the right Poupart's ligament. The right hip-joint was flexed to nearly 90° and extension was very limited and painful. In this position of flexion other movements of the hip-joint were almost normal. Nothing abnormal could be seen or felt in the spine or loins. Rectal examination showed marked tenderness on the right side. The X ray films of the spine and hips were negative. The urine was sterile.

On the operating-table the hip-joint remained flexed even after the patient was deeply anæsthetised, thereby showing that the flexion was not due to irritation of the psoas muscle. An incision was made above Poupart's ligament and, after the fascia iliaca had been incised extraperitoneally, about a pint of greenish pus escaped. On exploration of the abscess cavity its connexion with the psoas sheath was established (hence the persistent flexion due to the distension of the sheath). The wound was drained and uninterrupted recovery followed, with complete range of movement at the hip-joint.

CASE 2.—A girl, aged 6½, was admitted on July 24th, 1929, suffering from pain in the right hip, which had lasted for four days. She had been unable to walk for two days. On admission her temperature was 102° F. Tenderness was marked in the right iliac fossa and a mass could be felt there. The right hip-joint was flexed to a right angle and extension was painful. There was a nearly healed septic toe on the left foot. X ray films of the spine and hip were negative. A blood count showed 19,000 white cells. The urine was sterile and contained approximately 70 pus cells per c.mm. McBurney's incision was made; the appendix appeared healthy but the psoas was bulging and was incised and drained through the abdominal incision. Staphylococci were grown from the pus and the von Pirquet test was negative.

CASE 3.—A boy, aged 13, was admitted on April 7th, 1929, complaining of aching in the right hip, thigh, and knee for a week. He was unable to walk. On admission his temperature was 102° F. and his right hip was flexed to an angle of 45°. The spine appeared normal. At operation the iliopsoas sheath was exposed extraperitoneally, incised, and drained. Staphylococci were grown from the pus.

CASE 4.—A girl, aged 4½, was admitted on August 4th, 1929. She was limping and constipated and had had pain in the right thigh for six days. On admission her temperature was 101° F. and extension of the right hip was limited and painful. A swelling could be felt in the right iliac fossa and bimanual rectal examination showed that it extended into the pelvis. Leucocytes, 25,000. The urine was sterile, and contained approximately 70 cells per c.mm. The abscess was aspirated and *Staphylococcus aureus* was grown from the pus. No tubercle bacilli were

seen. X rays of the spine and hip were negative and the von Pirquet test was negative.

DIFFERENTIAL DIAGNOSIS.

In none of the cases was the correct diagnosis made before admission to hospital. The presence of a psoas abscess was not recognised in three cases. Case 1 was diagnosed as an acute appendicitis and Case 2 as an appendix abscess. The insidious onset and the absence of marked and progressive signs of peritonitis in spite of continued pyrexia should distinguish acute iliopsoas abscess from acute appendicitis and appendix abscess. The flexion of the hip-joint, which is maintained during anæsthesia, should help further to make this distinction. Case 3 was diagnosed as acute arthritis of the hip, a condition which is characterised by the immobility of the joint. In this case, however, on careful examination it was found that all the movements could be made painlessly if the hip was held in flexion. In Case 4, in which a psoas abscess was recognised, the diagnosis of Pott's disease was made. There was no loss of mobility of the spine when the patient was sitting, and this was an argument for excluding the spine as the seat of disease.

PATHOLOGY.

Staphylococci were grown from the pus of four cases. Only in one case was there an obvious focus of infection—a septic toe. The non-tuberculous nature of these cases is shown by the fact that the von Pirquet reaction was negative in the three cases in which it was performed. In three cases the urine was sterile but its cellular count was definitely raised. If we assume that this high cellular count suggests an infection in the neighbourhood of the kidney—there being nothing to indicate an infection of the urinary tracts—the course of the disease is quite compatible with a lower pole epinephric abscess (Israel[1]) discharging into the iliopsoas sheath. The possibility that the pus may pass downwards behind the fascia iliaca is supported by Wolkow and Delitzin,[2] who have demonstrated that the anterior and posterior sheaths of the renal fascia fail to unite inferiorly. Non-spinous psoas abscess may also originate from either tuberculous or pyogenic lymphadenitis of the retroperitoneal glands, as described by Baer, Bennett, and Nachlas.[3] Also, the rare cases of acute arthritis of the iliosacral joint may give rise to a psoas abscess.

My thanks are due to the surgeons of the Queen's Hospital for Children for permission to publish these cases.

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A CASE OF SIMULTANEOUS DIPHTHERITIC AND SYPHILITIC INFECTION OF THE THROAT.

By Hester E. de C. Woodcock, M.B. Leeds,
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A man of 45 was admitted to the Leeds City Hospital on Nov. 8th, 1929, as a case of diphtheria. Before admission *B. diphtheriæ* had been isolated from the throat and 4000 units of antitoxin had been given. The history was that the patient had had a sore throat for two months. He had felt run down for some time, but had attributed this to a "septic finger," following an injury by a piece of wire in August.

On admission the man looked ill, with a greyish pallor. The temperature was 99° F. and the pulse-rate 102. There was some slight congestion of the fauces, most marked on the right. The tonsils were slightly enlarged, and on the right there was a thick mass of yellow slough filling the tonsillar fossa, with definite excavation of the lower end of the tonsil. There were one or two yellow patches on the posterior pharyngeal wall. The mouth was very offensive. The glands were enlarged and tender at the angles of the jaw, and also in the posterior triangles. The right index-finger had been on wet dressings for many weeks. The nail had been removed, the end of the finger was bulbous and sodden, and there was a little suppuration of the nail bed.

A Schick test could not be performed, owing to the administration of antitoxin before admission. Although the throat lesion was not typically diphtheritic, in view of the bacteriological findings, a further dose of 16,000 units of antitoxin was given on admission, and simple gargles prescribed before further investigations were made. The finger was fomented for a week, and then put on dry dressings. A direct smear from the throat showed only mixed cocci with no suggestion of Vincent's organisms, while *B. diphtheriæ* were again found in culture, and on inoculation into guinea-pigs proved to be virulent. The Wasserman reaction was positive.

On Nov. 13th the patient was put on hyd. c cret. gr. ii t.i.d., and six doses of 0·3 g. of novarsenobenzol were given intravenously at weekly intervals. On Nov. 16th he became very deaf, and on the 18th he began to ramble and became forgetful, but this condition only lasted a few days. On the 19th there were stabbing pains in the lumbar region shooting through the abdomen. On the 20th the throat, until now very resistant to treatment, became much cleaner but the excavation of the right tonsil was still very marked. The finger was by now almost healed. The throat was not absolutely clean until Dec. 10th. For the first three weeks after admission there was an irregular temperature, between 99° and 103° F., with an occasional drop to subnormal, the pulse-rate ranging from 84 to 128.

On Nov. 21st the patient developed a dark pink rash, punctate on the trunk and legs, somewhat papular on the arms and shoulder-blades. The next day it became more vivid, more profuse, and more measly in character, with small areas of white skin between the macules. The voice became hoarse, the throat congested and dry. The next day the rash looked more like a fading scarlatinal eruption, and by Nov. 24th it appeared as a diffuse dark erythem on the trunk, and gradually faded. On the 28th the temperature fell to normal and remained there, with the exception of an occasional rise after the intravenous injections. On Dec. 27th the tonsils were removed, as the throat culture persistently showed the presence of *B. diphtheriæ*. Ten days after the operation, when the fauces were completely healed, the cultures became negative, and the patient was discharged from hospital to the care of his own doctor.

The case is interesting because of the persistent presence of virulent diphtheria organisms in a throat which showed clinically a secondary syphilitic lesion, and because the condition failed to clear up on administration of diphtheria antitoxin. The true nature of the lesion was proved by the Wasserman reaction and by the response to antisyphilitic treatment.

The occurrence and peculiar nature of the rash raised several questions: (*a*) Was it caused by serum? Probably not, in view of its persistence and its changing type. (*b*) Was it an exanthem? Against this were the variability in type, the absence (apart from the congestion of the throat) of any other typical sign or symptom, and the fact that during the whole of his stay in hospital the patient was isolated. (*c*) Was it due to the novarsenobenzol? It occurred after the second dose, but on no other occasion. (*d*) Was it a syphilitic manifestation? This is probably the most likely explanation.

The "septic finger" began four months before admission, and healed shortly after antisyphilitic treatment was started. Could this have been the site of syphilitic infection, as there was no other evidence of primary sore?

I am indebted to Dr. J. S. Anderson, superintendent of the City Hospitals, for permission to publish this case.

REVIEWS AND NOTICES OF BOOKS

Malformations of the Jaws and Teeth.

By Dr. EMIL HERBST, Honorary Lecturer and Principal of the Orthodontic Division, Wilhelm's University, Westphalia; and Dr. MAX APFFELSTAEDT, Professor and Director of the Dental Institute of the University. London: Humphrey Milford, Oxford University Press. 1930. Pp. 320. 25*s*.

MALFORMATIONS of the teeth and jaws considered as a branch of antenatal pathology concern the anatomist, teratologist, and dental surgeon. They represent a fascinating chapter in the curious aberrations to which the human embryo is subject.

The first part dealing with malformations of the jaws is from the pen of Dr. Herbst. This section will interest particularly the student of teratology, for the malformations of the jaw are part of the larger subject of cranial defects. Dr. Herbst has collected examples of many rare conditions which are carefully described and fully illustrated. The chapter of most interest is that on cleft palate. It follows in the main the teaching of Karl Peter, whose explanation of the morphology of the elements involved in cleft palate differs from that usually followed in this country which is based largely on the work of Sir Arthur Keith. Peter believes that the cleft, where it is complete, instead of passing between the premaxilla and maxilla passes directly through the premaxilla itself. As is well known, in complete clefts the lateral incisor or a misshapen tooth which appears to correspond with it, lies most frequently on the distal side of the cleft and the separated premaxilla contains only the central incisor. It is true that the occurrence of supernumerary teeth in the region of the cleft is very common, and since they may not appear until many years after birth the exact identification of the morphology of the dental elements in the cleft region is difficult. Yet the appearance of the lateral (the pre-canine of Albrecht) on the distal side of the cleft is difficult to reconcile with the view that the cleft lies between the premaxilla and maxilla. Keith explains it by supposing that the lateral may be carried backwards by subsequent growth. He points out that exceptionally this tooth may be placed mesially to the cleft; it may lie at the apex of the cleft or more commonly it may be situated distally. These three positions are explicable by the later growth of the jaw. Peter, on the other hand, states that the cleft runs through the region of the lateral incisor, and in this way explains both its position on the distal side of the cleft and the frequent appearance of supernumerary incisors in cleft palate. The problem is primarily one for the embryologist. Perhaps the restatement of Peter's views in this book will stimulate some further investigation.

The second part of the book is by Dr. Apffelstaedt, and deals with malformations of the teeth. These, while of great interest to the dentist, are less intimately connected with the general problems of embryology and teratology than malformations of the jaws. Complete though this section is, we find a few omissions, notably the remarkable case recorded by J. H. Gibbs in the Transactions of the Thirteenth International Medical Congress under the title of Polyphyodontism in a Child, in which there were three rows of teeth superimposed on one another in the mandible. On the other hand, many of the malformations described are extremely rare, and the authors must have exercised a prodigious amount of industry to have compiled so full a catalogue of the monstrous and unusual. The anonymous translator has performed his task well and the book is free from that stilted phraseology common in translations.

Human Biology and Racial Welfare.

Edited by E. V. COWDRY. London: H. K. Lewis and Co., Ltd. 1930. Pp. 612. 28*s*.

AN omnibus volume of 25 essays by 27 authors which have this much in common, that they relate to the progress of natural knowledge on the one hand and to human welfare on the other. After an introductory chapter on life in space and time, the rest fall into four groups: the origin of man; man as a physiological unit; the effects of environment; the future. The essays are naturally of very unequal merit and interest. The chapter on the Reaction to Food is too much concerned with personal researches on vitamins. Similarly, the article on Adjustment to Infectious Disease misses a great opportunity, giving only rather a dull account of the antigen-antibody reaction. Sir Charles Sherrington and Dr. Fulton write on nervous integrations, Sir Humphry Rolleston on what medicine has done, Prof. W. B. Cannon on the integrative action of the circulating blood, Prof. Huntington (whose work is still less known than it should be) on the effect of climate—these and some of the others will be read with pleasure and profit. We only wish that there was a little more integration about the book as a whole.

Reflex Action: a Study in the History of Physiological Psychology.

By FRANKLIN FEARING, Ph.D., Northwestern University, Chicago. London: Baillière, Tindall and Cox. 1930. Pp. 350. 30*s*.

AT a time when "reflex action" occurs almost as readily to the psychologist as to the physiologist by way of at least verbal explanation of diverse and heterogeneous phenomena, a learned survey of the vicissitudes undergone by the conception since its earliest days is useful. The reader is taken lingeringly over centuries of thought and research, from the times of Descartes and Vesalius to those of the "Gestalt" school, and is amazed not only by the extent of the author's erudition but by his consummate skill in seizing what is essential and informative in a host of conflicting theories, thus enabling one to reach a position of orientation, a central place from which to look round. All this is admirably done, and human interest is added to the older material—necessarily somewhat dry—by reproduction of portraits of men well known in the history of the subject, and of title pages of old books.

We confess we find Prof. Fearing's comments at the close more valuable than much here set down to complete the historical picture. He distinguishes three variations of the concept as follows: (1) the "specific" concept regards reflex action as possessing certain physiological and psychological characteristics differentiating it from all other kinds of action; (2) the "genetic" concept, according to which there is no sharp break between reflex action at one end of

the scale and volitional response at the other; (3) the "mechanical" concept, which declares receptor-effector action to underlie and predetermine *all* behaviour. He puts his finger unerringly, it seems to us, on the cruxes of the situation; we must find out how volitional control is operative upon reflexes, must determine what we mean by automatism, must look past merely artificial terminology to what is actually happening when the organism adjusts itself. Prof. Fearing has not given us enough of his own decisions and conclusions; curiously, one of those he does offer—viz., "the sterility of the faith that mind and behaviour can be envisaged by number and measure has been exposed"—is precisely one which cannot be accepted without reserve.

General Practice (Some Further Experiences).

By ERNEST WARD, M.D.Cantab., F.R.C.S.Eng. London: John Bale Sons, and Danielsson, Ltd. 1930. Pp. 108. 3*s*. 6*d*.

Dr. Ward, whose volume "Medical Adventure" was favourably reviewed in these columns recently, presents in this little work some further experience of general practice with the same soundness and amusing shrewdness which characterised its predecessor. Fate, we learn from his words, has ordained for him a wide and varied experience of general practice. "I have," he writes, "had practices with clubs and without, practices on foot, push-bike, and car, medico-legal work, operations, and other side activities," and it is clear that the various episodes set down could only have come from the pen of one, who, in addition to possessing powers of observation and capacities for sympathy, had this wide range of experience. There is not a chapter in this book where the young practitioner will not find some guiding word—some apt piece of counsel for application in the conduct of practice.

Modern Infant Feeding.

By BERNARD MYERS, C.M.G., M.D., M.R.C.P. Modern Treatment Series. London: Jonathan Cape, Ltd. 1930. Pp. 160. 5*s*.

Dr. Bernard Myers has here supplied a summary of the physiology of the infant and the theory and practice of infant feeding, which, considering the small size of the volume, is remarkably complete. The method of artificial feeding, which is described in most detail, is a fairly simple dilution of cow's milk with added carbohydrate and low fat content; the uses of and indications for other preparations are also discussed. The last chapters contain accounts of the clinical features and the treatment of some alimentary disturbances, such as diarrhœa and marasmus. Like other volumes of the series to which it belongs, the book has the advantages of convenient size and low price.

Les maladies des vésicules séminales.

By E. CHAUVIN, Professor of Clinical Urology at the Medical School of Marseilles. Paris: N. Maloine. 1930. Pp. 216. Fr.40.

Prof. Chauvin has attempted to estimate the importance of the seminal vesicles as a source of trouble in urological conditions. As he points out in his preface, his countrymen are inclined to disregard the vesicles and concentrate their attention on the prostate, whilst American urologists consider the vesicles as of equal importance, at any rate in cases of chronic urethritis and cystitis. Luys alone, of all French urologists, has stressed the rôle of the vesicles in maintaining chronic infections and in acting as a primary focus in such troubles as gonorrhœal rheumatism. As a preliminary to his description of the pathology of the vesicles, the author devotes a chapter to their anatomy. Unfortunately, he illustrates his text by means of a plate which is somewhat misleading, since the vesicles are shown in an almost vertical position, whereas, in fact, they approach more nearly the horizontal and lie almost in contact with the upper margin of the prostate. No attempt is made to discuss their physiology, which is surely an omission in so comprehensive a work. The second part of the book deals entirely with pathology, and the third with surgery. Much extremely useful information has been here collected and presented in a readable form. It is curious that the author does not dwell on the utility of diathermy in cases of acute gonococcal infections; he leaves the impression that he is in favour of surgical intervention, and has little faith in less drastic methods. The work contains a very complete bibliography which should make it of use to all surgeons who have to deal with this region. The importance of vesicular infections is being more and more recognised, and the appearance of a complete treatise on the subject is to be welcomed.

Handbook of the Vaccine Treatment of Chronic Rheumatic Diseases.

By H. WARREN CROWE, D.M., B.Ch.Oxf., M.R.C.S., L.R.C.P., Director of the Charterhouse Rheumatism Clinic; late Consulting Physician (vaccine treatment) Yorkshire Home for Incurable and Chronic Diseases. London: Humphrey Milford, Oxford University Press. 1930. Pp. 52. 2*s*. 6*d*.

THE object of this small book is to set out in detail the author's method of treatment, by stock vaccine, of chronic rheumatic conditions. Dr. Crowe has used this form of treatment at his rheumatic clinic since 1928 with, he believes, considerable success; further, he holds it to be quite suitable for use in general practice. The vaccine is prepared from 155 different strains of streptococci, and one staphylococcus which he has named *S. deformans*. Very small doses are given, since in his opinion reactions are harmful and should at all costs be avoided. Although the author puts forward this treatment as one simple enough as to be eminently suitable for use by the busiest practitioner, this advice must be taken with caution, for pitfalls exist and error would be so disastrous to the patient: it is possible that the technique is more complicated than Dr. Crowe suggests. At one point in the book the author says: "Now, since all the rheumatic diseases respond in exactly the same way to vaccine treatment, whether they are thought to be microbic or not, surely the only possible inference is that they are all microbic." This is not sound reasoning, since it is impossible to tell how far the reaction is due to the injection of a foreign protein. Anyway, the theory and practice can be tested, for Dr. Crowe invites practitioners to visit his clinic and see the work in progress and the results obtained; he will, further, supply the vaccine free for trial.

THE LANCET.

LONDON: SATURDAY, AUGUST 9, 1930.

PLACENTAL HORMONES.

As long ago as 1905 HALBAN suggested that the placenta could act to some extent as an organ of internal secretion, and that it was capable of producing a supply of the hormone now called œstrin. The properties of this interesting substance have been mentioned in these columns on many occasions and it will be recalled that the physiological action which has so far received most study is the inducement of the cyclical changes of œstrus or "heat" in rodents and other laboratory animals. This result follows administration of the hormone either to the immature female before natural puberty, or to the mature animal in which the normal sexual cycle has been completely arrested following double oöphorectomy. Œstrin itself has no effect on the ovaries of the animals, and its action is principally upon the uterus and vagina, in which it brings about characteristic changes. A substance with very similar properties, and assumed by most workers to be identical with œstrin, is obtained from the ovaries themselves, principally from the liquor folliculi, and is also present in surprisingly large quantities in the urine during pregnancy. Consequently, the latter is a very convenient source for the preparation of the hormone and from this source it has now been obtained in a crystalline state by several workers.[1] This substance is of such remarkable purity that only about one ten-millionth of a gramme of the pure substance is sufficient to bring about œstral changes when injected into castrated mice. Its preparation from the placenta and from urine has been described by a number of workers, principally E. A. DOISY, A. BUTENANDT, G. F. MARRIAN, E. C. DODDS, and F. DICKENS. These investigations of its chemical properties show the substance to be weakly acidic, probably a lactone of a fairly complex hydroxy-acid having several hydroxyl groups. It is soluble in fat-solvents though it may also be obtained in aqueous solution, and it is rather surprisingly stable to strong acids and alkalis and to heat; boiling the solution has no effect and the purified substance may be redistilled at about 150° C. in a high vacuum.

It is uncertain whether the placenta actually secretes this hormone in the way suggested by HALBAN, or whether, according to another theory, the presence of œstrin is due to a protective action of the placenta in preventing the circulating maternal hormones from reaching the fœtus. It is clear, however, that this is not the only hormone having a special relationship to the placenta. In 1928 B. ZONDEK showed that implants of small pieces of human placenta into mice caused not only precocious sexual maturity, but also stimulated the immature ovaries so that ovulation sometimes occurred and corpora lutea were found in large numbers in the ovaries. A very similar result follows implants of pieces of anterior pituitary gland, as was shown in 1926 by P. E. SMITH and E. T. ENGLE and independently, in the same year, by B. ZONDEK and S. ASCHHEIM. Since injection of the untreated urine of pregnant women brings about closely similar results it follows that besides œstrin, this other luteinising hormone is excreted during pregnancy. In fact the luteinising property of the urine is the basis of ZONDEK and ASCHHEIM'S biological test for the diagnosis of pregnancy. There is thus a close resemblance between the properties of this other substance contained in the placenta, and those obtained respectively from the urine and the anterior pituitary, though it seems too early as yet to assume with ZONDEK that definitely the same substance is concerned. This second principle, which may be briefly referred to as the luteinising hormone, differs markedly from œstrin in its chemical as well as its biological effects. It is freely soluble in water, though not at all in fat-solvents, and is a very labile substance at once destroyed by boiling and damaged even by heating to 60–70° C. Probably other active substances are present in placenta and urine, though these are as yet less well defined. Thus claims for separate follicle-ripening principles (ZONDEK) and a substance bringing about mucification of the vagina (B. WIESNER) have been put forward. It is not yet generally agreed to what extent the difference in these principles is qualitative rather than quantitative. Perhaps the most convenient classification for the present is to distinguish (1) those hormones which act only via the ovary, such as the anterior lobe luteinising hormone; and (2) those primary sex hormones which are elaborated by the gonads themselves and are represented by the testicular hormone and œstrin. Whereas the second group are sex specific the first act equally well on the male or female sex organs and may be called the gonad-stimulating hormones, since they are without effect on the castrated animal.

From this point of view the recent work of COLLIP[2] [3] may be examined. In his first preliminary communication on the subject, which we noticed in THE LANCET of March 1st, 1930, no details were given of the method of preparation of the substance obtained from human placenta and used for clinical tests. He claimed only to have isolated from the placenta "certain micro-crystalline fractions" which showed great activity in promoting precocious sexual maturity. The criterion of activity was the occurrence of œstrus in immature female rats, accompanied in some cases by the presence of corpora lutea in the ovaries. Since the latter result was not constantly found and has now been abandoned by COLLIP as a criterion of activity of his extract, it is important to inquire what steps were taken to differentiate the material from œstrin, the presence of which in the placenta is well known. From the chemical point of view

[1] See THE LANCET, 1930, i., 94.

[2] Collip, J. B.: Canad. Med. Assoc. Jour., 1930, xxii., 215, 761.

[3] Collip, J. B., and Campbell, A. D.: Ibid., 1930, xxii., 219.

the evidence is not very definite. The method of preparation used by COLLIP is briefly as follows :—

The minced placenta is extracted with alcohol, the active principle being soluble in all strengths of this solvent. After removal of the alcohol by distillation and of the lipoids by extraction with ether, the solution is suitable for clinical use. Crystals can be obtained by addition of ammonia to the concentrated solution. The purified product is relatively insoluble in water and about 1 mg. is obtained from a kilo of placenta. The potency is unaffected by boiling for five minutes in dilute acetic acid, though the saline solution may deteriorate on keeping. No further chemical details are given of the properties of the hormone since the amount available as yet for experimental work has been insufficient. The unit of the purified substance is provisionally considered to be of the order of 0·0015 mg.

In this process the preliminary treatment with alcohol would facilitate the extraction of the œstrin from the placenta. After removal of the fats with ether, probably only a trace of œstrin would remain in the aqueous portion. The question arises as to whether this amount is responsible for any of the physiological actions observed by COLLIP—i.e., the production of precocious maturity in the experimental animals. COLLIP'S concluding words on this point are :—

"It has been suggested . . . . that œstrin or 'theelin,' as Doisy has now named the ovarian hormone, has not been entirely removed from our extract, and that the œstrus effects which have been obtained by its use may be attributable to traces of this hormone. Due to the consistent negative results which extracts of human placenta have given when tested on oöphorectomised animals, it was felt that this interfering factor had been adequately controlled. Larger doses will have to be given in the œstrin assay, over longer periods of time, to make this point clearer."

The wisdom of repeating and extending the experiments to cover these important points, and to indicate in a more definite way the true nature of the active substance or substances is obvious. The new name "emmenin" proposed for the active substance, in COLLIP'S most recent paper, seems appropriate, but its general adoption is likely to be delayed until final proof has been obtained of its identity. This important work has aroused so much interest in clinical as well as biochemical circles that the results of its further development will be eagerly looked for.

SEASONAL VARIATION OF INFECTIOUS DISEASES.

THE parasitic nature of epidemic disease having been established beyond all reasonable doubt, there has been a recrudescence of interest in the equally well established seasonal variation in endemic and epidemic infection, which occupied so much of the attention of the older school of epidemiologists. Dr. T. J. MADSEN, in an address[1] delivered at the London School of Hygiene, surveys the seasonal factor in Danish epidemics during the last 40 years. In Denmark notification of all infectious diseases has long been obligatory ; the land has long been sheltered from natural catastrophes and war ; there has been no great epidemic, and climatic differences in this small country are not marked. Seasonal variations are therefore of particular interest. Dr. MADSEN showed how the Danish morbidity statistics confirm in all details those noted by the older observers and conform closely with the seasonal periodicities of other European countries and North America. Scarlatina, diphtheria, angina tonsillaris, and acute rheumatism, for instance, increase during the autumn to a maximum in November, drop a little in December, rise to a second peak in January, and then fall to a minimum in July. Broncho-pneumonia, bronchitis, and influenza display a decided maximum in January and February, falling to a minimum in August. The incidence of croupous pneumonia follows the same curves, but does not reach its maximum until March–April. Another winter-spring group is formed by cerebro-spinal meningitis and encephalitis ; the former has its maximum in February and the latter in April–May. Among the summer-autumn infections are epidemic diarrhœa, typhoid fever, and poliomyelitis. The last of these runs a curiously opposite seasonal course to the other nervous epidemics, so that Dr. MADSEN wonders whether the intestinal canal may not play a part in its ætiology. Measles and whooping-cough show no regular seasonal fluctuations, but it is a peculiar feature of any measles epidemic that there is always a depression in the month of September. In the southern hemisphere the curves are reversed to correspond with reversed seasons.

Dr. MADSEN considers and rejects the theory that the variations may be on the bacterial side and allies himself with SYDENHAM in looking for some periodic change in man. N. FINSEN and L. ISACHSEN have found a periodic fluctuation in the quantity of hæmoglobin and the number of blood corpuscles, with a minimum in January and a maximum in July. J. LINDHARD has found a similar oscillation in the frequency and depth of respiration, the quotient of ventilation, and the alveolar carbonic acid tension ; this he ascribes not to temperature but to light. Dr. MADSEN therefore puts beside his other curves the sunshine returns for the year, and plots in one figure the general mortality-rate, the incidence of bronchitis and the respiratory frequency ; the curves follow one another with remarkable faithfulness. Annual fluctuations are also known to occur in bodily weight—a minimum in February and a maximum in September—and in the vitamin content of food. Dr. MADSEN treads cautiously among these fascinating possibilities, and points out the enormous field that yet remains unharvested. He ventures to suggest, however, as a prophylactic measure, an effort to secure more efficient light in the dark period, and urges the medical profession to encourage people to get out into the open air and sunlight as much as possible in winter.

The French Academy of Medicine lately listened to a discourse on a similar subject[2] by Dr. M. A. TRILLAT, who has been impressed by the importance of barometric pressure on the origin and duration of epidemics. In support of this thesis he quotes the mortality of the European influenza epidemic of 1889 to 1890, in which, he says, the

[1] Public Health, July, 1930, p. 309.

[2] Bull. de l'Acad. de Méd., 1930, ciii., 698.

mortality rose and fell with the humidity. He states that a similar correspondence has been noted in other epidemics, though not in the influenza epidemic of 1918. Here he supports Sir LEONARD ROGERS, whose numerous brilliant investigations have shown how closely the incidence of many infectious diseases in correlated with the "absolute humidity" of the atmosphere. Dr. TRILLAT himself attributes the action of humidity on disease incidence to its effect on the transmission of "droplet infection." Thus far most modern epidemiologists would be inclined to agree with him, but when he speculates that sudden barometric depressions cause an evolution of gases from soil and organic refuse, and that these gases form a suitable nutritive medium for organisms growing or multiplying in the air, he has probably lost the sympathy of the modern bacteriologist who no longer believes that specific pathogens can multiply to any extent in the atmosphere.

These two papers form an interesting contrast; the one attributes the action of season and climate to its effects on the host, producing alterations in resistance to infection. The other attributes the effects of season to alterations in the "transmission factor"; for example, a high humidity, as one sees in a common mist or fog, permits the maintenance and suspension of microbe-containing droplets for a longer period than in a dry atmosphere. Undoubtedly both factors are important determinants of seasonal morbidity, but which is the more important is unknown. Their weight probably varies greatly in different types of disease and environment. Finally it is interesting to note how all epidemiologists have given up "bacterial variation" as an important cause of the seasonal changes in morbidity, just put forward by PASTEUR. We wonder if they are always justified in doing so.

INTRABRONCHIAL DRAINAGE.

THE lung has been described as the most perfectly drained organ in the body. Free outlets, however, mean free inlets, and the bronchial system which gives such easy passage for the expectoration of secretions and debris facilitates the rapid spread of infection from the primary airways to the lung tubes, from one side of the chest to the other, and from terminal bronchi to air cells. In the chest, as elsewhere, we must learn to think of diseases as affecting not organs but systems. The pulmonary tract is one and indivisible. We might almost say that though there are five lobes there is only one lung. The ease with which fluids pass from the upper air passages to the main bronchi and their subdivisions is demonstrated by the injection of lipiodol. Under the fluoroscopic screen the oil can be seen to reach the terminal bronchioles within two or three minutes of its injection. A very slight tilting of the patient suffices to determine the flow to the right or left lung. Oil injected into a bronchial fistula of one lung can be made to flow into the opposite lung by a simple change of posture. It is not surprising that chronic pulmonary affections are usually bilateral, and we may well wonder how it can be that infection associated with bronchiectasis is, at times, limited to a single lobe, while except in the earliest stages of the disease unilateral tuberculosis is very infrequent. The manner in which the disease spreads to the contra-lateral organ makes it almost certain that this spread is due to inhalation from the affected side.

In a recent paper on intrabronchial drainage HAROLD BRUNN and WILLIAM B. FAULKENER [1] remark that proper evaluation has not been given to the mechanical factors which are present in nearly every case of pulmonary suppuration. They point out that drainage of a suppurating area in a lung may be external or internal. In the former, septic matter is removed by expectoration. In the latter, pus welling up from the diseased focus spills over into adjacent bronchi, or crosses the tracheal carina, to track into the opposite lung. Failure to appreciate the mobility of septic matter within the lung tubes may lead to error in diagnosis of the site of disease. Thus an upper lobe abscess may discharge its contents into the lower bronchi, and in such a case, after the patient has maintained the erect position for some hours, the physical signs may suggest a lower, rather than an upper, lobe lesion. On the other hand, if secretion is not excessive external drainage may suffice to maintain the dilated tubes of an upper lobe bronchiectasis in a fairly dry condition.[2] Mechanical factors, again, may determine the flow of pus from the left lower to the right upper lobe if the patient remains recumbent on his right side. The violent spasms of coughing to which the victims of pulmonary suppuration are liable is due to bronchial blockage. BRUNN and FAULKENER point out that the injection of lipiodol by the oral route causes no cough unless a bronchus becomes obstructed through the accumulation of oil, when violent coughing is at once aroused. Sudden occlusion of a bronchus will cause severe cough even though all possibility of bronchial irritation has been abolished by cocaine. This observation has an important bearing on the posture of a patient during certain operations on the chest. If, for example, during a pneumotomy for abscess the patient lies upon his sound side, pus from the diseased lung may spill into the opposite main bronchus, and the patient will be in danger of choking, unless the violent, and otherwise very undesirable, spasm of coughing set up leads to expectoration. Such a misadventure is obviated by bronchoscopy before operation, and the bronchoscopic cleansing of after operation is an additional safeguard.

Internal drainage is not limited to lipiodol injections or pulmonary suppurations. It is significant that in a "migrating" pneumonia the physical signs of consolidation over one upper lobe are often followed by the development of similar signs at the opposite lung base. Such an event is, perhaps, rightly interpreted as due to a spill over of infection and a flow determined by mechanical considerations.

[1] Harold Brunn, M.D., and William B. Faulkener, jun., M.D.: Intrabronchial Drainage, Amer. Jour. Surg., Gyn., and Obst., July, 1930, p. 115.

[2] W. Burton Wood: The Oral Injection of Lipiodol as an Aid to the Differential Diagnosis of Upper Lobe Bronchiectasis and Pulmonary Tuberculosis, THE LANCET, 1930, i., 1339.

ANNOTATIONS

QUARANTINE FOR AIRSHIPS.

FLIGHT across the world is rapidly becoming so common as to bring a new anxiety to public health officials. The possibility of the introduction of disease —especially yellow fever—by passengers from airships was considered seriously by the permanent committee of the International Office of Public Hygiene in May of this year. There are obvious difficulties to be overcome before satisfactory aerial regulation can be established; for example, little is yet known about the behaviour of mosquitoes towards aeroplanes and airships—whether they accompany them readily or not. Experience has shown that transportation of adult mosquitoes aboard sea-going ships is rare, but whether this distaste for foreign travel is extended to flying machines has yet to be investigated. Regulations would presumably be applied at aerodromes where incoming 'planes made their landing, but some special system of supervision would have to be devised for seaplanes.

It is not long since we referred [1] to the position of Australia, once happily isolated by a sea voyage, now at the mercy of every air pioneer. Plague and cholera which are prevalent in Bombay and Rangoon are not conveyed to Australia by sea, since the incubation period is shorter than the voyage, but the flight from Rangoon has been accomplished in 62 hours. Small-pox could actually be transported from England by flight during the incubation period. The disadvantages of quarantine in such cases are obvious; the time saved by the traveller, at considerable expense, would be wasted in idleness at the quarantine station. In India the fear of the introduction of yellow fever following the completion of the Panama Canal has now been replaced by the risk of an entry along the Imperial Airways route to Karachi. The report of the Yellow Fever Commission suggests a quarantine period of three days for persons sick with yellow fever, there being no known example of mosquitoes receiving infection from human feeding made after the third day of the sickness. The quarantine periods for airships coming from infected areas have not yet been decided.

MEDICINE IN INDUSTRY.

THE crisis in industrial production during the war and the revolution in commercial procedure which has taken place since 1918, with the resulting changes in our social system, have tended to bring the profession of medicine into far closer touch with industry and commerce. The importance of the human factor in industry is increasingly realised, and industrial medicine has begun to take its place as an integral factor in the communal life.

The essentials of a welfare scheme are lucidly sketched in a brochure [2] recently issued by the Industrial Welfare Society. It is shown that welfare work is neither a luxury for rich corporations nor a system of organised care likely to diminish the worker's sense of individual responsibility. Every industry has its own needs, and some of sufficient size find it desirable to hand over much of the welfare work to qualified medical men or women who, if they find such work congenial, can render to industry services of a high order which are, however, of so varied a nature that dogmatic pronouncements on their functions are likely to be of little or no value. Perusal of the Society's pamphlet may well raise a number of important questions in the medical reader's mind. It is noteworthy, for instance, that our greatest industry, agriculture, still remains outside any existing scheme such as operates in the urban areas. It has to be realised, again, that the unemployed members of the population tend to deteriorate in an alarming fashion during long periods of idleness, and that this deterioration should be largely a matter for medical advice and scientific study. A third and related problem is the increase noted annually in the amount of sickness benefit drawn by insured workers. Decrease in the infant mortality-rate has not so far shown any commensurate increase in the physical standard of the young entrants into industry or, to judge by the debate reported on p. 318, of recruits for the armed forces.

It is not only difficult but undesirable to lay down definite lines for medical work in industry, but it is obvious that, in a somewhat neurotic age, pension schemes, saving funds, holiday funds, and the stimulation of healthy hobbies and pastimes are of definite therapeutic value. Production has in the past ten years advanced at a rate out of all proportion to our consumption, and at the same time there has been an increasing tendency to reduce working hours. The result of these two factors is that leisure and the spending of money need guidance into channels leading to mental and physical health, lest they tend to defeat the very ends which we have expected. Education becomes more important, and the results of it, be they good, bad, or indifferent, must in the end be reflected in the national health. Thus we find it impossible to divorce matters merely industrial and medical from matters national and non-medical, for we are all members of one body.

THE FEAR OF DRUG ADDICTION.

IT is probably true to say that on the whole more suffering is caused to mankind by the terror of drug addiction than by the addiction itself. Many practitioners could cap the story which Dr. R. D. Gillespie makes the text of a recent article.[1] A patient for whom he had prescribed a hypnotic rang up next day to report that his wife had shrieked, wept bitterly, and pleaded with him not to take the medicine ordered lest he become a drug addict. Dr. Gillespie ascribes the confusion of the public mind to two origins: to the universal association of the words "dangerous" and "drugs," because they stand in this relationship in the title of an Act of Parliament, and to the divided teaching of the medical profession. The layman tends to speak of addiction whenever any drug which cannot be described either as a tonic or an aperient is being taken continuously. This habit of mind will often yield to explanation, but it is harder to convince him that it is safe to take a remedy which has been branded as pernicious by some eminent doctor. Nor are the chemists entirely without blame; Dr. Gillespie cites the case of a pharmacist who took upon himself when dispensing a prescription to read the patient a homily upon his self-destroying folly in taking the medicine ordered. Another offender is the medical witness at inquests. Too often he

[1] THE LANCET, 1928, ii., 613.

[2] The Introduction of a Works Welfare Scheme. I.W.S., 51, Palace-street, London, S.W.

[1] Brit. Jour. of Ineb., July, 1930, p. 6.

fails to draw attention to the wide margin between hypnotic and lethal doses of a drug. Not very long ago the veronal group was condemned as a whole because a man had succeeded in committing suicide by swallowing the uncomfortably enormous dose of 300 grains of adalin.

Dr. Gillespie quotes official figures to show that the suicide-rate from hypnotic drugs is by no means alarming, but he has been unable to find statistical evidence to show whether true addiction is associated with these drugs at all, or whether addiction leads to suicide. Clinically, addiction of any kind is uncommon in this country, and the records of cases are hard to come by. Another example of the confusion surrounding this subject is the fact that an example of "addiction and suicide" is quite often made out of a case in which, for instance, the patient, having taken 10 grains of veronal regularly for a year without increasing the dose, swallowed some lysol and died. Morphia and cocaine, the real drugs of addiction, provide a feeling of well-being and a refuge from anxiety; these benefits are not conferred by the veronal group, and in fact some patients complain of discomfort in the head after a dose. Dr. Gillespie remarks that he has yet to find the patient who craves an increase of dose for the dose's sake. The reduction of anxious preoccupation sometimes obtained from these drugs is only temporary and cannot be maintained by repeated doses. He finds a remedy for the unsatisfactory state of affairs in studying the patient. To order a hypnotic and at the same time to alarm the patient by warnings and official regulations is to nullify its effects, but the doctor who knows his patient knows to what extent he can be trusted to carry out a treatment. "In such a way," Dr. Gillespie concludes, "and without the fuss of drastic regulations which could only doubtfully save the few, and which would undoubtedly handicap the many, hypnotics may be used safely and successfully."

BENIGN MENINGITIS.

THE label meningitis carries so bad a prognosis that where patients with many or all of the classical symptoms have suffered from a benign type of malady with complete recovery the diagnosis is often considered doubtful. Nevertheless, there are cases of this kind in which examination of the cerebro-spinal fluid has left no doubt of some meningeal reaction. This was the lesion described, many years ago, by Quincke as "serous meningitis," and recently a good account [1] of some cases under the title of "acute aseptic meningitis" has been given by A. Gunther, of Gothenburg. These cases, 13 in number, were mostly in children, and nine of them came under observation in early autumn months. The symptoms were those of acute meningitis, and included a brief prodromal period followed by an abrupt onset, with headache, fever, vomiting, and drowsiness. Five of the patients showed apathy, but none lost consciousness. Stiffness of the neck muscles was noted in four cases. Lumbar puncture in each case showed cerebro-spinal fluid under pressure, mostly clear, with excess of protein. Cells, numbering up to over 600 per c.mm. in one instance, were present in excess, and mostly consisted of mononuclears. The sugar content of the fluid appeared to be within normal limits in the cases where it was estimated. The chloride content does not seem to have been calculated, and bacteriological examinations were all negative. All 13 patients made a good recovery, and on re-examination after periods varying from eight months to over seven years none of them showed any sign of permanent damage to the central nervous system in any way. Gunther discusses the differential diagnosis and possible ætiology of these cases under various headings. The acute infective types of meningitis, such as tuberculous or cerebro-spinal, can be excluded on the evidence obtained. Syphilitic meningitis is likewise excluded on general grounds as well as by negative Wassermann reactions in the fluid in his cases. Epidemic (lethargic) encephalitis is more difficult to exclude, but various points are against it, including the absence of any sequelæ. The diagnosis narrows down to the question of whether this acute aseptic meningitis is a distinct type of meningitis or whether it represents a meningitic or abortive form of infection by the poliomyelitis virus. Gunther is inclined to favour the second alternative. Approaching the subject from another angle, H. Sievers [2] discusses the differential diagnosis of tuberculous meningitis in children, particularly as regards cases of so-called "meningism" associated with otitis media or some acute infection in some other part of the body. He describes several cases which clinically and from the examination of cerebro-spinal fluid are identical with Gunther's, and he concludes that an exact diagnosis between meningism and tuberculous meningitis may be impossible except as indicated by the progress of the patient. Tuberculin tests do not help greatly in these acute cases; the fact that bacilli are not found in the cerebro-spinal fluid does not exclude tuberculous meningitis, and more elaborate tests last longer than the illness. Sievers favours the view that otitis media leads to some sort of irritation of the meninges with a lymphocytic reaction. Neither of the views here expressed will satisfactorily explain all examples of "meningism," however, and further work is necessary. It would be a good thing if the chloride content of the cerebro-spinal fluid was always estimated in such cases.

[1] Jahrb. f. Kinderh., 1930, cxxviii., 127.

[2] Ibid., p. 228.

FURUNCULOSIS OF THE SALMONIDÆ.

FURUNCULOSIS has received renewed attention during the last few years on account of its rapid spread in salmon rivers in Scotland where the financial loss has been considerable, and in England and Wales where the damage, especially in trout streams, has been serious. An interim report [3] of the Furunculosis Committee of the Ministry of Agriculture summarises what is known of the various aspects of the disease and contains the results of recent investigations. The chief features of the pathology are the furuncles which are usually multiple, and the almost invariable septicæmia. The latter may cause death without discoverable local lesions or may occur in apparently healthy fish which can act as carriers and spread the infection. Histologically the furuncles are centres of necrosis and vascular congestion in the muscles or subcutaneous tissues which become softened but show no cellular reaction. There is no doubt that fish-farms have often been infected and that the disease has been spread by stock fish introduced from such sources in this country or on the continent. The possibility of a river becoming infected by salmon entering it from the sea is discussed in the report and dismissed as extremely unlikely on the grounds that no salmon has been conclusively proved to be infected unless it has been at least a short time in fresh water, that of

[3] H.M. Stationery Office. 1930. Pp. 65. 3s. 6d.

the many salmon caught and examined on their way down none has been infected, and that the irregular distribution of the disease in rivers whose mouths are adjacent is much against this view. There is, in addition, ample evidence of possible introduction from fresh water sources. The infective agent, *Bacillus salmonicida*, is easily recognised by its cultural characters, especially by the soluble brown pigment which colours the culture medium and by its pathogenicity for gold-fish, gobies, and frogs. When the virulence of a culture is low its identity can still be confirmed by complement fixation. Miss Williamson, who has been studying the disease under the Committee for the last two years, has attacked various aspects of the bacteriological problem and has published some results in appendices to the report. Among other important observations she finds that salmon eggs are not infected internally and can be disinfected and used for breeding even when they come from an infected source. The Committee recommends that importation of live fish should be prohibited, fish-farms supervised, and research on the outstanding problems continued and extended.

THE SENSORY PATHWAY.

Prof. J. S. B. Stopford has already published a series of studies on the arrangement and functions of the sensory system, and has impressed neurologists with the exactness and clinical applicability of his work. He has now dealt in more comprehensive fashion with the sensory pathway from periphery to cortex, being mainly, if not solely, concerned with one aspect—viz., that of objective change.[1] The equally significant questions of sensory overaction, of hyperæsthesia, of escape and release are not at present dealt with, since the researches along these lines are not yet complete. However, the fundamental facts are here set forth, and the functions of the various sections of the system are "welded into a harmonious whole."

Speaking generally, Prof. Stopford is convinced of the dual nature of the system, in the sense that both cutaneous and deep sensibility are divisible into sub-systems concerned respectively with protection and with discrimination. Probably no one conversant with the facts will dispute the general contention, even if details of interpretation cannot be universally accepted just as they are here stated. An ingenious effort is made to explain the phenomena of recovery after nerve suture in accordance with this duality. Although the anatomist and histopathologist is unable to distinguish any morphological differences in respect of regenerating fibres—and this fact may be thought by some to militate against dualistic interpretation—Prof. Stopford relies on the clinically demonstrable situation to argue that the protective system recovers function first and the discriminating system later. He assumes that in the circumstances "the paths by which cortical activity are aroused are out of action," and asserts, further, that "in the absence of activity of the sensory cortex, the corticothalamic fibres will not function." Both of these statements are open to criticism, though they are essential for his theory; a prick is felt, during processes of recovery, because "a prick can only appeal to the thalamus," and, as noted, the sensory activity of the cortex is declared to be in abeyance. Thus the further assumption is, that pain is appreciated as such only by the thalamus, and that the latter is conscious of its own activity. Objections which have been raised to this way of looking at the facts of clinical observation are rather summarily dismissed, and insufficient attention is given to the equally important fact that the hypothesis of thalamic release is not as yet erected on any sufficiently precise pathological basis however plausible it be. Indeed, we find constant reference to the action of "cortico-thalamic" fibres without any exact description of their anatomical locus, and without any hint that thalamocortical fibres may be intermingled therewith. The thoroughly unsatisfactory nature of the war-wound cases on which Head relied for his estimation of the site and extent of the sensory cortical system, and for revelation of its functions, is not made clear; in this respect precise clinical and pathological investigation is still required. Prof. Stopford has given considerable attention to sensory disorders resulting from medullary lesions, but does not appear to have seen cases in which the loss of sensibility consecutive to involvement of the descending root of the fifth has been of segmental type, not corresponding to peripheral branches of the fifth; and this appears to weaken his conclusion that the most cephalic part of the spinal nucleus of the trigeminal receives fibres from the inferior maxillary division, and so on in reversed order for the other two. In certain cases of syringobulbia the loss over the face runs across peripheral arrangements; Prof. Stopford does not take this circumstance into account. There is thus much in his thesis to provoke discussion, but no one will peruse its pages without being convinced of the strong case made out for physiological duality, and without recognising the numerous points in which a further sound addition to knowledge has been made by his researches.

[1] Sensation and the Sensory Pathway. By John S. B. Stopford, M.D., F.R.S., Professor of Anatomy, University of Manchester. London: Longmans, Green and Co. 1930. Pp. 148. 7*s*. 6*d*.

RADIUM TREATMENT OF RECTAL CANCER.

In recording his experience of the radium treatment of rectal carcinoma during five years ending last December, Sir Charles Gordon-Watson reports[1] on a group of 93 cases. He describes, as follows, the various ways in which cancer of the rectum can be rendered accessible to radium barrage: (1) Posterior barrage by open operation from the perineum with needles; (2) intra-abdominal radiation with needles or seeds; (3) radiation through the vagina; (4) intra-rectal radiation with needles or seeds; (5) radiation through the perineal skin; and (6) surface radiation on Columbia paste. So far, he says, he has not been able to employ distant "bomb" therapy. Recently a number of operable growths have been irradiated without preliminary colostomy. For intra-abdominal radiation Sir Charles considers a filtration of 0·8 mm. of platinum essential; as regards the danger of implanting needles into supraperitoneal growths, he points out that while emanation seeds are undoubtedly safer it has as yet been difficult to get a sufficiently heavy radiation. Favourable types for radium treatment have been squamous growths at the anal margin and small ones low down in the anterior rectal wall in women; the latter can be effectively treated by vaginal barrage. Sometimes an inoperable case has been rendered operable by preliminary use of radium, and the difficulties of radical operation have not been noticeably increased, though healing after operation has been slower than usual. Sir Charles points out, however, that radical operation should not be attempted after abdominal radiation owing to the likelihood of adhesions from the resulting plastic inflammation. Summing up the

[1] Brit. Jour. Surg., 1930, xvii., 643.

present position he says that for an operable cancer of the rectum radical excision should still be advised unless the patient is unfit or refuses the treatment, in which case radium should be tried as holding out "great though uncertain prospects of cure." For inoperable growths he believes that a small but increasing proportion of cases may be cured by radium treatment, while many advanced ones may be much relieved.

As an introduction to this paper, Dr. Cuthbert Dukes, director of the research laboratory at St. Mark's Hospital, records his observations on the spread of cancer of the rectum. He classifies the tumours in three groups, A, B, and C, according to the depth which cancer cells are shown to have reached. Three-quarters of the cases examined fell into Group C, in which the tissues surrounding the rectum are invaded by direct spread through the rectal wall, and in the first 100 cases examined there were 40 Group C cases in which metastases were found in the regional lymphatic glands. On the other hand, no evidence of lymphatic involvement was obtained in the 25 cases of Groups A and B which were examined. The conclusion reached by Dukes is that metastasis in the lymphatic glands is usually late and that it occurs only when the cancer has spread by continuity into the perirectal tissues. His observations emphasise the importance of upward lymphatic spread but minimise the likelihood of lateral and downward spread. As a method of estimating prognosis the routine method of cutting large sections to prove the anatomical depth of spread is likely to be valuable. Dukes has also made another interesting observation—namely, that protuberant growths are more likely to be Group A or early Group B cases without lymphatic metastasis, whereas excavated ulcers are more likely to be Group C cases, with at least a 50 per cent. probability of lymphatic spread. This observation suggests the advisability of removing ulcerated growths by an abdomino-perineal excision or by one of the several two-stage modifications which are now available; or if radium treatment is undertaken the path of upward lymphatic spread must be attacked as well as the growth itself.

WAS NAPOLEON AN EPILEPTIC?

NEARLY every writer on epilepsy enumerates the great men who have suffered from this disease, and Napoleon usually heads the list. F. M. Kircheisen [1] finds little to support this assumption. The evidence is, he says, contained in four sources—the memoirs of Lewis Goldsmith, Constant, Talleyrand, and Madame de Rémusat. Goldsmith, in a lampoon published in 1810 and widely circulated in several languages, states that a lady who was visiting Napoleon one night roused the palace with the news that he had fallen into an epileptic fit. Constant, a valet who published his memoirs in 1830, quotes the letter of a lady of the palace writing from Coblenz on Sept. 10th, 1804, in which she narrates that the Emperor had suffered on the previous night from "a severe shock to the nerves, or epileptic seizure." Nevertheless, in the same work, he states positively that Napoleon never had epileptic attacks and that the report of them was merely one of the many falsehoods concerning him which circulated among the multitude. Moreover, since on Sept. 9th and 10th Napoleon was at Aix and not in Coblenz, this particular story stands discredited. Talleyrand is a more formidable witness; he gives a circumstantial account of a seizure which occurred one evening in September, 1805, after he had dined with the Emperor. Kircheisen points out, however, that it is not likely that Talleyrand dined with Napoleon, because the Empress was at that time in Strassburg and the Emperor used then to dine only with her. Talleyrand, moreover, according to Kircheisen, was not noted for veracity; Napoleon hated him thoroughly, and the memoirs published in Talleyrand's name are a forgery by Bacourt. Madame de Rémusat burnt her first draft of memoirs and wrote the second from memory. She describes the scene related by Talleyrand as occurring in 1806, when Napoleon was leaving Mainz. Her account is rendered suspect by her statement that Napoleon was so overcome by the absence of his wife and Talleyrand that he shed copious tears and vomited. None of the four sources therefore are very convincing. Kircheisen justly points out that epileptic attacks recur and that, if Napoleon had really suffered from them, the fact would have been common knowledge to all his associates. Bourrienne, who was disgraced by Napoleon and certainly had no reason to be tender with him, states categorically that he never saw a sign of the disease in 11 years' close contact with the Emperor. It is almost conclusive that none of the medical men who attended him, and who left medical commentaries on his health, recorded that he had ever suffered from an epileptic attack. Sir Hudson Lowe, the Governor of St. Helena, would certainly have mentioned the fact had it existed. There is no doubt that Napoleon was highly neuropathic, but Kircheisen's essay leaves little ground for the belief that he was epileptic.

[1] Deut. Med. Woch., June 20th, p. 1057.

POST-VACCINAL ENCEPHALITIS.

THE treatment of post-vaccinal encephalitis with the serum or citrated blood of vaccinated persons has been followed by remarkable results. In the first case, recorded by Sir Thomas Horder,[1] a boy, 4½ years old, received intrathecally 5 c.cm. of the serum of his mother who had been vaccinated at the same time. He recovered rapidly and completely. J. Hekman,[2] of Rotterdam, has now reported nine typical cases treated in this way between August, 1929, and February, 1930, and quotes seven others. In all but two of these 16 there was quick recovery after the serum or citrated blood of a convalescent from vaccination was administered. The dose was usually 10 c.cm. and it was almost always given intravenously. The patients were children 3½ to 11 years old, and they received the blood of the mother or father, all but one of whom had been vaccinated at the same time. One child who recovered was apparently much benefited by the serum of the father, who had been vaccinated four years before. The effect of the treatment appears to have been very striking and certainly encourages the use of similar measures in cases of this serious complication, which is said to be fatal in about 30 per cent. of cases in Holland. Those who, like Hekman, favour the view that post-vaccinal encephalitis is due to the virus of vaccinia alone, are inclined to look on the dramatic issue of the treatment as proof that their view is correct. A notable feature was the rapidity with which the symptoms disappeared after injection of serum, although the patient had been vaccinated 10 or 13 days before the symptoms began and the serum was given two or three days later still when the vaccinia vesicles were completely developed. A second important fact

[1] THE LANCET, 1929, i., 1301.
[2] Bull. de l'Acad. de Méd., 1930, ciii., 539.

was that the donors of the serum were usually at the same stage of vaccinial infection as the recipients. Hekman thinks that the rapid action of the serum suggests an antitoxic rather than an anti-infective influence.

Grüneberg [3] reports two severe cases in children of 12 years and 1 year and 9 months who made good recoveries after receiving intravenously two doses each of the serum of recently vaccinated persons in quantities of 10 and 8 c.cm. respectively. The first dose was given about the fifteenth day after vaccination and on the third or fourth day after the onset of cerebral symptoms.

SCHOOLS FOR ABNORMAL CHILDREN.

A BOOKLET issued by the Board of Education and obtainable through any bookseller [4] shows the accommodation available for exceptional children, including the blind, the deaf, the mentally defective, the epileptic, those crippled in various ways, and those suffering from rheumatism, heart disease, pulmonary tuberculosis, and ophthalmia, as well as open-air schools for the delicate. The schools are not arranged according to the various disabilities, but a clear indication of the purpose of each is given in a separate column. Thus if a place is sought for a child with a particular disability, a glance down this column will show where it may be looked for; though it must, of course, be remembered that room can seldom be found for children not belonging to the authority that maintains the school.

The list indicates that accommodation in the country as a whole is more nearly adequate than it was, especially for children classified as physically defective, but for certain other types of defect there has been little improvement. Only one of the six schools for epileptics is entirely maintained by an education authority (Manchester), and the total accommodation for the whole country is only about a quarter of what is needed. The list does not make it clear what provision exists for cases of combined defect, but there is no doubt that it is quite insufficient. The deaf who are slightly mentally deficient or merely subnormal, as well as the deaf and partially blind, are well worth training; but though they cannot profit by the oral methods most valuable for the intelligent, very few special facilities are available. The position of the subnormal blind is somewhat similar; they cannot be taught to read Braille fluently, but they are not ineducable in other ways. The Ellen Terry Home for Blind Defective Children is noted in the list, but in the past this has been occupied by sightless imbeciles and not those for whom the need of special training is urgent. Subnormal and high grade defectives suffering from epilepsy are often accepted in the schools for epileptics, while those who can be deemed imbecile or ineducable are received in many institutions under the Mental Deficiency Act; it is for the intermediate class that little is at present possible. Combined physical and mental defect of the type of the cerebral paralytics also presents great difficulty, especially when the mental defect appears to be moderate. Schools for the unstable and delinquent children are not mentioned, doubtless because they are seldom definitely under the Board of Education, but there is a little accommodation for them in some of the schools described as being conducted by voluntary bodies mainly for the mentally defective, and there are the pioneer child guidance clinics. Use might well be made of the industrial schools, most of which have been so improved and humanised that the old prejudices against them vanish when they are visited. In many the care and influence are so good that the boy who is sent there may be far more fortunate than his comrade whose delinquencies are undetected or inadequately treated.

The second part of the list deals with institutions giving higher education of cripples and others with handicaps, and includes many famous foundations like Alton and Chailey, as well as the part-time classes for the deaf and blind. Part 3 enumerates the 31 nursery schools now established. The figures of accommodation show their inadequacy, and it is noteworthy that more than half of these schools are conducted by voluntary managers. But evidently a start has been made, and from other sources it is clear that local authorities are beginning to take an interest in the work.

[3] Klin. Woch., June 14th, p. 1127.
[4] H.M. Stationery Office. Pp. 33. 9*d*.

THE "PRIMARY AVOIDABLE FACTOR" IN MATERNAL MORTALITY.

AN abstract of the first part of the interim report of the Departmental Committee on Maternal Mortality published this week, will be found on p. 321. The section of the report which in our view deserves most careful attention is the analysis of the cause of 200 maternal deaths by two expert obstetricians working on behalf of the Committee. The scheme set out in the report for an adequate national maternity service is on the general lines of that published by the British Medical Association,[1] while the plea for better education of medical students, as well as midwives, in obstetrics, only reiterates, however cogently, the arguments often set out in our columns and elsewhere. But the search for a "primary avoidable factor" in each fatal case is a new method of approach which has not been limited to the examination of records. Medical officers of health who have been entrusted with the duty of compiling these records, have been encouraged to enlist the help of a specialist in midwifery, with power to remunerate him for his services. The practitioners concerned have mostly welcomed and cordially coöperated in a calm survey of any case with a fatal issue, and its educational value to all concerned cannot be overestimated. The results of the investigation are extremely interesting. Excluding the 404 women who died from causes not due to pregnancy there remain 1596 deaths of which 626 show a primary avoidable factor; in other words 626 deaths might have been prevented. It is in some unexpected place that error is found, and this constitutes the chief value of the report. For example, it is estimated that many lives might have been saved merely by applying to cases of ante- and post-partum hæmorrhage the accepted medical methods of replacing lost fluid, while of 218 cases of eclampsia lamentably few were detected and treated at the stage of albuminuria when graver complications might have been avoided. Throughout the report there is evidence of a sympathetic rather than a hypercritical attitude towards the doctor and midwife, and it is because their difficulties are well appreciated that some of these difficulties, at any rate, are likely to be removed as the outcome of this inquiry.

THE Medical Research Council have appointed Maj. A. G. Church, M.P., Dr. F. E. Fremantle, M.P., and Sir John H. Parsons, F.R.C.S., F.R.S., to be members of their Industrial Health Research Board.

[1] See THE LANCET, 1929, ii., 195, 561.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCV.

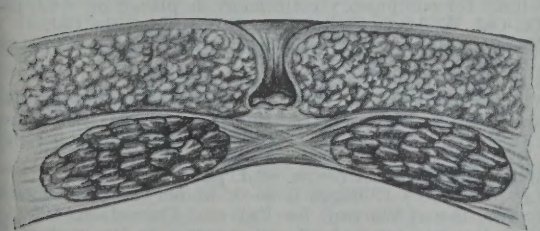
UMBILICAL HERNIA IN INFANTS AND ITS TREATMENT.

AN umbilical hernia in an infant is far more commonly met with at the present day than it was 20 to 30 years ago. Further, the mechanical treatment of such a hernia by a truss is apparently not nearly as efficacious as it was in years gone by.

The reasons for this definite increase in incidence are not far to seek. Many infants nowadays are not breast-fed, but are brought up from birth on patent foods. Such feeding predisposes to flatulence and abdominal distension, which prevent the abdominal wall musculature from acting to its greatest advantage, and which also to some extent prevent the normal development of the recti muscles. Hence at an early age the muscles of the abdomen are weak and flabby. Sooner or later the abdominal distension causes constipation, and this marks the commencement of a vicious circle. To overcome the constipation purgatives of a drastic nature are only too frequently given; the bowels very soon become exhausted, and a chronic distension ensues. Another factor contributing to the causation of an umbilical hernia is traction on the cord at the time of delivery or within a week after birth. The midwife is over-anxious for the "navel string" to separate. The mother frequently volunteers the statement that the nurse pulled off the "navel string" a few days after the child was born.

In these enlightened days the mother is usually instructed to discard the abdominal binder as soon as possible, being told that the child will grow more rapidly if it is not confined by tightly fitting garments. As an umbilical hernia does not often become manifest until some weeks after birth, it is, in my view, of the greatest importance that an infant should wear an abdominal binder until it is at least six months' old. If this advice were followed invariably there would be far fewer cases of infantile umbilical hernia attending our hospitals.

FIG. 1.



Section through the anterior abdominal wall showing the relation of the umbilicus to the recti muscles.

Mechanical Treatment.

Treatment should in the first place be prophylactic. If the causative factors enumerated above were instilled into the minds of midwives and mothers far fewer cases would require operative measures.

Undoubtedly a large percentage of umbilical herniæ in infants can be cured by mechanical means. It must be remembered that during the development of the embryo in utero an umbilical hernia is present from the fifth week to the third month, and that even under normal conditions it may be present at birth.

The normal umbilicus is a cicatricial depression in the mid-abdominal line situated about the junction of its upper three-fifths with its lower two-fifths. When observed from the front it is roughly circular and exhibits a certain amount of puckering. When viewed in cross-section the cicatrix is seen to lie immediately superficial to the crossed fibres of the rectus (Fig. 1). The upper part of the umbilicus is weaker than the lower. There is considerable separation of the recti in infants at birth, but after birth as the muscles grow they tend to approximate, and the linea alba becomes narrower. Generally speaking, the more cicatricial or fibrous tissue there is round the opening of the umbilicus, the slower its

FIG. 2. FIG. 3.

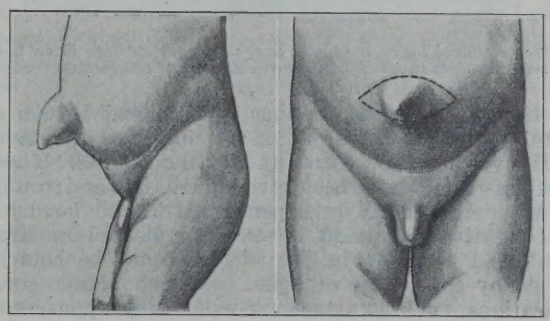


FIG. 2.—Umbilical hernia in an infant. This is the type which is difficult to cure by a truss.
FIG. 3.—Umbilical hernia showing incisions to enclose the umbilical cicatrix.

closure. Hence it is essential that no irritation be set up in its vicinity. It is important, therefore, that when treating an umbilical hernia the skin and subcutaneous tissues should not be folded in before any strapping or truss is applied.

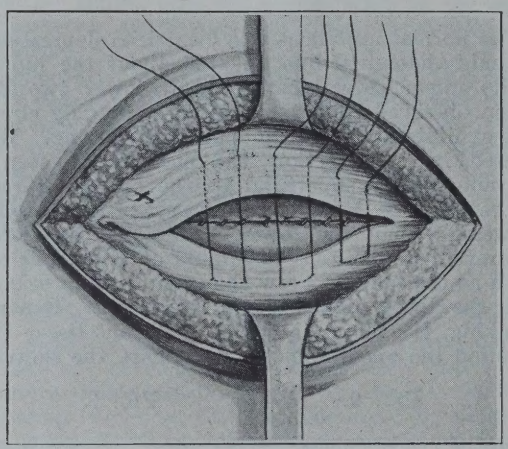
Probably the best method of mechanical treatment is to make a pad from a cork disc covered with muslin. It is essential that the disc be considerably larger than the hernial defect, otherwise it will defeat its own ends and cause the opening to become much larger. This warning may seem over-emphatic, but I have removed from infants under the age of one year ineffective trusses improvised from farthings, threepenny pieces, and sixpenny pieces. Possibly at infant welfare clinics the mother is told to make a truss from a penny or a halfpenny piece, and, left to her own resources, she considers a small silver coin would be better for her baby.

The truss should be retained in place by a piece of adhesive strapping. Should the application of the truss be difficult owing to the crying of the infant, a simple expedient which is always successful is to suspend the child by its feet and then to apply the truss.

Operation.

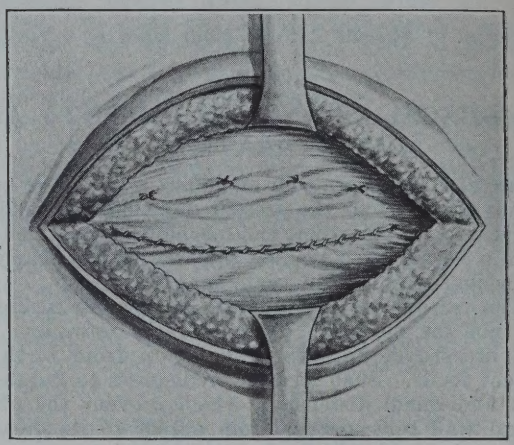
Mechanical measures should be tried for one year, and if at the end of this period the condition be stationary and the hernia a large one, operation should be advised. Some authorities state that mechanical means should be persevered with up to five years, but few mothers are patient enough to endure this, and, moreover, the skin of the abdominal wall becomes irritated after prolonged truss pressure, and the normal development of the recti muscles is interfered with. Another small but important point

FIG. 4.



The peritoneal layer is closed and mattress sutures have been inserted to produce horizontal overlapping of the rectus sheath.

FIG. 5.



The mattress sutures are tied, and the overlap is secured with interrupted sutures.

is that in a certain number of umbilical herniæ in adults there is a history of an umbilical hernia in infancy which was cured by wearing a truss. These patients would have been saved much time and trouble if an operation had been performed in childhood.

Operative treatment is always indicated in large umbilical herniæ (Fig. 2), which cannot be held in place by a bandage or truss. In such herniæ complications, such as attacks of colic, may appear and an operation should be advised before they occur.

The actual operation should be performed after the method advocated by Mayo. Transverse crescentic incisions are made above and below, whereby the hernia is encircled (Fig. 3). The sac is carefully defined and cleared of fat, and the neighbouring aponeurosis cleared for some little distance round the neck of the sac. The aponeurosis is then divided close to the neck by transverse incisions and the sac opened. The contents are now returned to the abdomen, but should any adherent omentum be present, it may be removed. Special care is directed to the margins of the opening, which must be carefully cleared. The sac, the adherent tags of omentum within it, and the overlying skin are then cut away completely, and great care must be taken to secure hæmostasis of the cut edges. The opening is now limited by two peritoneo-aponeurotic flaps, above and below respectively, and is closed by superimposing the upper flap over the lower and suturing them together by means of mattress sutures introduced through the margins of the lower flap and passed under and through the upper flap from within outwards (Fig. 4). The upper flap is then stitched over the lower, which it usually overlaps to the extent of an inch (Fig. 5). The wound is now closed with interrupted silkworm gut sutures without any drainage. The skin sutures are removed on the seventh day, and the little patient can, as a rule, be discharged on the tenth.

It is possible to preserve the umbilicus if necessary, but I do not admit the necessity. To state that for purely æsthetic reasons it is inexcusable to sacrifice the umbilicus seems to me to be overstating the case. By replacing a troublesome hernia which has been a source of annoyance for a long period by a neat horizontal scar the surgeon should give complete satisfaction to the infant's fond parents.

Years ago operating on infants for inguinal hernia was regarded with great aversion. To-day this is no longer the case; infants of all ages are constantly being operated upon for this form of rupture, and the time has surely arrived when more attention should be paid to the treatment of large umbilical herniæ occurring in infants.

CECIL P. G. WAKELEY, F.R.C.S. Eng., F.R.S. Edin.,
Surgeon to King's College Hospital and to the Belgrave Hospital for Children.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. G. D. Walsh is placed on retd. list with rank of Surg. Capt.

The following appointments are notified: Surg. Lt.-Comdr. G. S. Rutherford to *Pembroke*, for R.N. Hospital, Great Yarmouth. Surg. Lts. J. M. Sloane to *Adamant*; J. G. Ollerenshaw to *Emerald*; and F. L. A. Hughes to *Cyclamen*.

ROYAL NAVAL VOLUNTEER RESERVE.

The following appointments are notified: Surg.-Lts. D. C. Wilson to *Albury* and H. Winstanley to *Pembroke*, for R.N. Barracks. Proby. Surg. Sub-Lt. A. J. W. Beard to *Emperor of India*.

ROYAL ARMY MEDICAL CORPS.

Col. T. E Fielding, late R.A.M.C., having attained the age-limit for compulsory retirement, is placed on retd. pay.

Lt.-Col. W. D. C. Kelly, from R.A.M.C., to be Col.

Maj. (temp. Lt.-Col.) W. Mitchell to be Lt.-Col., vice Lt.-Col. W. D. C. Kelly.

Maj. E. B. Lathbury to be temp. Lt.-Col.

The undermentioned Lts. to be Capts.: E. H. Hall (prov.), G. A. Walmsley, A. Sachs, R. A. M. Humphrey, R. T. P. Tweedy, W. R. C. Spicer, G. T. L. Archer, and M. R. Burke.

Maj. A. S. Cane retires on retd. pay.

Lt. (on prob.) J. Beggs is secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion, 1926.

C. S. Gross is granted a temp. commn. in the rank of Lt.

ROYAL AIR FORCE.

Dental Branch.—Wing Commander C. L. Colbran (Lt.-Col. Army Dental Corps) is granted a permanent commission in this rank.

Capt. G. A. Ballantyne (Army Dental Corps) is granted a permanent commission as a Flight Lt.

The undermentioned are granted non-permanent commissions as Flight Lieutenants: Flight Lts. R. G. J. Charlesworth and H. I. Clapperton (temp. Capts., General List, Army, Dental Surgeons); Flying Officer P. M. Margand (temp. Lt., General List, Army, Dental Surgeon).

F. B. Sumerling is granted a non-permanent commission as a Flying Officer.

INDIAN MEDICAL SERVICE.

Capt. D. H. Mirchandani, late I.M.S. (T.C.), relinquishes the rank of Capt.

SPECIAL ARTICLES

MEDICINE AND THE LAW.

Successful Objection to Coroner's Finding.

THE High Court quashed another coroner's inquisition on July 24th. The inquest related to the death of a woman at Nottingham, and the finding to which objection was taken was that she died by falling downstairs "when under the influence of drink." The only evidence to justify the words quoted was that of her husband. Asked by the coroner: "Had she had any drink?" he replied, "Yes." The deceased had in fact had less than one glass of beer at a friend's house. The husband, if questioned further, would have said that she was a woman of temperate habits and was perfectly sober immediately before the accident. Her son and other witnesses were prepared to say the same. The Lord Chief Justice, who sat with Mr. Justice Avory and Mr. Justice Wright, said that the coroner's finding, involving a reflection on the dead woman, was arrived at on insufficient inquiry. On that ground the inquisition would be quashed and there would be a fresh inquest before another coroner.

This is the third occasion in the past six months on which THE LANCET has recorded the quashing of an inquisition. It need not be assumed, however, that the percentage of irregularities in proceedings before coroners is high. Though it may be tempting to compare the figures of quashed inquisitions with the statistics of convictions and sentences quashed by the Court of Criminal Appeal, the totals are not comparable. Persons convicted at quarter sessions or assizes have every opportunity of appealing; irregularities seemingly trivial and technical are often relied upon. On the other hand, coroners' inquisitions are not quashed for trifling irregularities, nor are inquests brought before the High Court for review unless there has been some patent and conspicuous cause of complaint. In the latest year for which statistics are available (1928) there were 31,553 inquests. During the same period some 7000 persons were indicted at quarter sessions and assizes. On review by the Court of Criminal Appeal, 22 convictions were quashed during 1928, convictions for another offence being substituted in two of these cases; 22 sentences in addition were quashed and other sentences substituted. More convictions are quashed than inquests, although the total of inquests held in the year is more than four times that of the total relevant criminal trials. Nevertheless coroners have need to be careful; there are impatient critics of their ancient office. In the Nottingham incident it is a pity that the witness did not find tongue to correct any possible misunderstanding. In the official statistics of inquests there is a separate class for deaths found to be due to drink. The finding which has been quashed might have misled the statistician, a result less unfortunate than the unjustifiable reflection upon the deceased which so much judicial effort has been needed to correct.

Professional Secrecy.

The court, as usual, over-ruled a protest made a few days ago by a medical witness who was being asked to disclose information about a patient. He was present on subpœna at the instance of a wife who was petitioning for divorce from her husband in undefended proceedings. The medical practitioner had attended the husband and was required to answer a question regarding his patient. The President of the Divorce Court directed that the evidence be given. The witness, before giving it, explained that he had his patient's written permission; otherwise he would have refused even at the risk of the personal consequences of disobedience to the court's direction.

The moral duty of professional secrecy is universally accepted. In the present state of affairs it is deemed cancelled either by judicial compulsion or by the patient's permission, and both these elements were present in the instance under discussion. Nevertheless the witness's resistance was not an idle exhibition of heroics. Such public protests are necessary if the present position is to be changed. Is there any adequate reason why the relationship of doctor and patient should be less privileged than that of solicitor and client? No solicitor is compelled to disclose in court his client's confidences. The legal profession enjoys complete privilege in professional matters. The benefit, of course, is that of the client not of the solicitor. Similarly, the patient should have the benefit of complete privilege as regards the non-disclosure by the doctor of details of health and treatment. Are members of the public less anxious for secrecy when they consult their medical than when they consult their legal adviser? Is the encouragement of frankness less desirable in the one case than in the other? The public sets a high value upon professional secrecy. It should insist on the fullest possible protection against disclosure. The medical profession will be willing enough to comply; it has its own tradition in the matter.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

DIETETIC THERAPEUTICS OF TUBERCULOSIS OF THE SKIN.

AT one of the recent meetings of the Wiener Gesellschaft der Aerzte Prof. Volk discussed the dietetic treatment of tuberculous lesions of the skin, which has received much attention of late. Prof. Volk emphasised the error of applying the expression "Gerson's" diet to this method, since Gerson's diet causes an alkalæmia, whereas an acidæmia is aimed at by Hermannsdorfer and Sauerbruch. The essentials of the diet recommended by the last-named observers are: (1) the exclusion of sodium chloride or its reduction to a minimum. (2) an attempt to effect a "transmineralisation" by giving the patient copious quantities of fresh, if possible uncooked, vegetables containing different salts and vitamins. The best results attained by this method have been in cases of lupus, which have made astonishing progress. In the special Lupus Institute of Vienna, which Prof. Volk controls, a special dietetic kitchen has been opened, out of which over 80 patients are supplied. The involution of the lesion takes place either without any reaction, the œdema disappearing and the nodules being replaced by an atrophic scar, or, in other cases, a reaction of the tissues takes place, with hæmorrhage, or even slight necrosis. These changes are followed by rapid healing, and may be manifest in different parts of the affected areas at

different times. In Prof. Volk's clinic the dietetic treatment is sometimes augmented by a combination of helio- and hydro-therapy, applied with due care, since the skin of such patients is extremely susceptible to external irritations. Temporary reactions, even psychical depressions or maniacal conditions, have been observed, but may be avoided if care is taken. Tuberculous patients seem to be specially liable to reactions such as a rise in temperature and increased secretion of sputum. Other dermatoses besides lupus have been treated with a salt-free diet and have responded favourably, notably some cases of pemphigus, psoriasis, and conjunctivitis eczematosa. One case of a very old-standing X ray ulcer was noted as especially favourable. Other authors have reported good effects in eczema, but it is unanimously agreed that tuberculous affections of the lungs are not affected by this diet; even in affections of the bones no remarkable results have hitherto been obtained.

MITOGENETIC RAYS.

Dr. G. Politzer, at the same meeting, read a paper on the present knowledge relating to the mitogenetic rays discovered by Alex. Jurwitsch in 1923.[1] He showed that from the roots of onions rays are emitted, which cause increased proliferation of cells and karyokinesis. Since then different observers have shown that numerous other plants and animal cells emit such rays. In man the normal blood, the voluntary muscles, and the bone-marrow emit rays which affect bacteria and certain kinds of yeast. The importance of these observations lies in the fact that malignant growths have a much stronger tendency to emit these rays than benign growths, and that in persons suffering from carcinoma or sarcoma the blood soon loses its property of emitting this kind of ray. The possibility exists that this phenomenon might lead to a means of early diagnosis of cancer if a practical detector for these mitogenetic rays could be found. Hitherto all the methods of detection suggested have been complicated and tedious to apply. Prof. Sternberg, Dr. Stempel, and Dr. Paltauf have recently investigated a new optic method, but this does not seem to give reliable results. At the moment, therefore, these rays are still only of theoretical interest to medical men.

RESECTION OF THE STOMACH IN OLD PEOPLE.

Patients over 60 years are, even nowadays, only rarely subjected to an extensive operation on the stomach, since the risk is deemed too great. The diagnosis of a malignant stenosis of the pylorus calls for operation even in quite old people, and even in less urgent conditions it may be justified. Prof. Finsterer recently showed two cases with the following histories. The first patient was 81 years old. Nine years ago he had an operation for an ulcer which had invaded the pancreas. The operation was performed under splanchnic anæsthesia, two-thirds of the stomach being resected. The patient still enjoys full health. The second man is now 80 years old, and has been suffering for 30 years from recurrent pains in the stomach and attacks of vomiting. The pain has increased since 1924, but operation was not considered owing to the age of the patient. In 1927, however, he had an attack of such severe pain that he demanded operation, however great the risk. Under splanchnic anæsthesia a callous ulcer was found on the lesser curvature near the pylorus. Half the stomach had to be removed with typical end-to-side anastomosis. In neither case was the ulcer malignant. Prof. Finsterer said that he has operated on 1400 patients of advanced age for similar conditions, and as a result of his experience believes that they should be given a chance.

[1] See THE LANCET, 1930, i., 1416.

THE LATE PROF. EMIL REDLICH.

After a rapidly progressing illness, Prof. Dr. E. Redlich, the well-known neurologist, died in his sixty-fourth year. From the outset of his medical career Redlich specialised in neurology, and he served as assistant in the neurological and psychiatric clinics of Vienna until, in 1907, he was elected chief of the neurological institute endowed by the Vienna branch of the Rothschild family. His scientific work was extensive, and there is no chapter in neurology to which he did not add a useful contribution. Redlich's splendid diagnostic powers and profound knowledge brought him deserved success in private practice. During the war he organised a special department for the patients suffering from injuries to the head, and his monograph on gun-shot wounds of the skull is a standard work. He has also taken great interest in encephalitis lethargica.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

SUPPLY OF RADIUM.

THE American Society for the Control of Cancer shows that only about 64 grammes of radium are available in this country. This is probably about the same amount as in France and twice what there is in Great Britain. Nearly 200 g. have been extracted from carnotite ore in the United States (Colorado and Utah) but most of this was absorbed in the manufacture of radium paint for war purposes and the ore which used to give 2½ to 3 per cent. of U_3O_8 is now exhausted. The yield of the remaining ore is about 1½ per cent. and the cost of production is prohibitive. The total amount of radium produced in the world is estimated at between 500 and 550 g. How much of this has been dissipated in the manufacture of luminous paint, especially during the war, is not known. The remainder could no doubt be used more efficiently if it were concentrated in recognised centres for the treatment of cancer, but this does not seem to be a practicable solution.

FEDERAL AGENTS PROVOCATEURS.

The antinarcotic administration of the Federal Government has recently come in for criticism, especially because of the employment of the *agent provocateur*. The Ohio State Medical Association points out that physicians have been prosecuted and fined for slight technical errors and that recently an honoured member of the Association, 71 years of age, was imprisoned in the Canton, Ohio, workhouse for nine months for dispensing tablets to an addict employed as a detective. The resolution points out further that the Federal Government has provided no institutional treatment for drug addicts but has issued a technical ruling that no ambulatory patient may be given a prescription for reduction treatment. The narcotic administration seems also to enrich itself on occasion by compounding with pharmacists who have unwittingly committed some technical violation of the highly complicated law.

RESEARCH IN SYPHILIS.

At a meeting of the Committee on Research in Syphilis held recently it was reported that grants totalling $91,515 had been allocated to twenty

ifferent investigators. Five clinics have been stablished in which attempts are being made to stablish criteria of cure and to study reinfection, elapse, and the development of complications. 'he Committee is chiefly engaged at present in studying he results of treatment in early and latent syphilis. Some 3000 case-histories are already available and they are being analysed by statisticians of the U.S. Public Health Service. The first results of the study will be announced in a paper on infectious relapse to be presented to the International Congress at Copenhagen in August.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of two counties, ne English and the other Scottish, of a county orough, and a burgh, and of two combinations of ounty districts.

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5yr.) mortality.	Maternal mortality from childbirth.
urrey .. .. (861,850)	14·4	11·7	0·69	1·43	2·3	2·1	50/—	20	3·1
)umfries .. (43,499)	18·9	16·4*	0·78	1·82	3·9	2·2	84/42	28	9·7
'lymouth .. (199,000)	16·5	13·5	0·95	1·49	3·1	1·7	59/31	33	4·8
'aisley .. (87,447)	20·5	15·1	1·01	1·54	3·7	2·2	89/42	46	3·3
West Gloucester-shire C.D. (51,987)	16·8	12·6	0·54	1·52	1·9	2·7	63/42	24	6·9
sle of Sheppey J.D. (25,735)	14·0	10·6	0·62	1·32	1·9	2·1	48/21	21	8·1

Stillbirths per 100 live births: Surrey 3·3, Dumfries 5·2, Plymouth 4·2, Paisley 5·0, Isle of Sheppey 4·6.
* Standardised 14·6. C.D. = Combined District. J.D. = Joint Districts.

Surrey.

Dr. J. Ferguson records a reduction in maternal nortality from childbirth to 3·1 from 4·9 in the previous year. In April, 1929, a medical officer with special experience was appointed to conduct 15 special antenatal clinics distributed through the county. Up to the end of the year 581 women attended for antenatal advice, and 89 for post-natal advice. The County Sanatorium at Milford was opened in October, 1928; by May 7th, 1929, the 298 beds were occupied and since then there has always been a waiting-list. Of the 795 patients admitted during the 15 months 280, or 35 per cent., had no tubercle bacilli in their sputum, but 67 of them showed tubercle bacilli after admission. Of the 435 discharged 143, or 33 per cent., never showed tubercle bacilli in their sputum. The average duration of stay before discharge was 134 days, and before death was 76 days. The number of bed patients was much larger than anticipated, and there is some difficulty in housing a staff capable of dealing with them. An improvement is expected when far advanced cases can be diverted to other county institutions. Artificial pneumothorax is performed in all suitable cases, patients returning for refills after discharge. There are approximately 1200 registered cowkeepers and 18,000 dairy cows in Surrey. During the last quarter of 1929 all the herds were examined. Mr. F. W. Medlock, the chief veterinary officer, points out that the value of routine examination is not only in the detection of cows with tuberculous udders, open cases of tubercle, and other pathological conditions, but it also facilitates education with respect to the hygiene of cattle and the prevention of disease. On inspection 7 cows were found to be giving tuberculous milk, 11 had tuberculous emaciation, and 20 had tuberculosis of the udder. The outside complaints of tuberculous milk numbered 18. In eight herds one or more animals were found to be giving tuberculous milk. One cow slaughtered showed tubercle of the udder. In six instances cows had been slaughtered or got rid of after the sample was taken, and the remaining members of the herd gave non-infected milk. In one case, where the complaint mentioned acid-fast bacilli resembling *B. tuberculosis*, the biological test was negative. The autopsy on 18 out of 19 animals whose milk was proved microscopically to be tuberculous showed advanced tuberculous lesions. The remaining animal was slaughtered by the owner before the result of the examination was known. Mr. Medlock notes that there is considerable misunderstanding by the public of the nomenclature adopted for graded milks. An expenditure of £20,000 has been undertaken as an unemployment relief scheme for the clearing and improvement of the river Wandle.

Dumfries.

Dr. John Ritchie ascribes the increased death-rate chiefly to influenza in the early part of the year. There were 54 deaths from influenza and 63 from pneumonia, against 11 and 35 in the preceding year. In 1929 the prevalence of scarlet fever was mainly in isolated country districts. The notifications of puerperal fever showed an increase, probably because the provision of hospital accommodation secures more effective notifying. A case, which was admitted to hospital as erysipelas, was finally diagnosed as "sokodu" or rat-bite fever, and made a good recovery. Another local case of the same disease was treated in hospital in 1914. The county veterinary inspectors, Mr. F. A. Davidson and Mr. G. A. Sangster, report an increase in the dairy farms owing to the opening of a new creamery at Carlisle. The new firm collects the milk at the farms, and the premises of cowkeepers who were registered for the first time as dairy-farmers have needed reconstruction. Contagious abortion is still on the increase, and as there is no evidence of undulant fever it is suggested that there are probably several strains of the organism which causes the disease in cattle. Regular inspection is leading to the earlier discovery of tuberculosis in cows, and the "not advanced" cases now exceed the "advanced" among the animals slaughtered. Bacteriological examinations have increased in number owing to the difficulty of distinguishing certain types of contagious mastitis from tuberculous mastitis. The use of a mild antiseptic for washing the hands of milkers and the cows' udders has tended to decrease the number with sore teats. The veterinary inspectors give reasons for suggesting that the designation "Certified" and "Grade A" should be dropped, and that "Grade A (T.T.)" and "pasteurised" should be the only designations.

Plymouth.

Dr. A. T. Nankivell, as in past years, includes reports by medical members of his staff on various sections of the work. Referring to the continued high maternal mortality, he suggests as remedies: (1) better education of doctors and midwives;

(2) greater use of antenatal clinics; and (3) the provision of a city maternity hospital. Dr. Marion Smellie says that during 1929 1100 pregnant women attended the clinics, including 414 primiparæ, but only 161 came back for postnatal examination. A post-graduate course held in October was attended by 68 midwives. Immunisation against diphtheria is becoming more popular. Preliminary Schick testing is only used in children of 9 years and over. During the year 259 susceptible children were made Schick negative. It has been found more satisfactory to give the three injections at monthly intervals, and a Schick test five weeks after the third injection. Dr. E. J. Hynes complains of the number of cases of diphtheria still admitted to hospital in a hopelessly advanced stage of the disease. Apparently practitioners of the district do not even now realise that a negative swab does not exclude diphtheria, and that in suspicious cases antitoxin should not be withheld pending the pathological report. Scarlet fever serum has been found useful when given during the acute stage of the illness, as well as for the temporary immunisation of contacts. Its supply free of charge to hospitals and institutions is advocated. Dr. Mildred Thynne says that investigation showed 8 per cent. of children from 1 to 5 years on the register of the centres to have threadworms. The affected children sometimes come from good homes. It is hoped to overcome the apathy of parents with regard to this complaint. Dr. Nankivell is disappointed at the slow progress with regard to three insanitary areas scheduled four years ago. There is still a shortage of houses. Dr. Nankivell has strong views on the propagation by feeble-minded and mentally defective. He quotes the recent remarks of a high court judge in support of sterilisation, and insists that the problem created by the steady and uncontrolled growth of these degenerates, who increase at the rate of about 2500 every year, must be faced by hard thinking.

Paisley.

Dr. G. V. T. McMichael's report shows that housing is the dominating problem at Paisley and intensifies the need for hospital provision for cases of tuberculosis, pneumonia, infectious diseases, and maternity cases. 15·1 per cent. of the dwellings are one-roomed, and 47·8 two-roomed; 572 houses are unfit for human habitation and past repairing. About 30 per cent. of these small houses are overcrowded, and there may be as many as nine persons in a one-roomed house. The council have decided to proceed with the erection of 125 two-roomed and 375 three-roomed houses at rentals approximating those of the uninhabitable houses—£12 to £15 per annum respectively. The death-rate was the highest since 1924. Nearly one-fifth of all the deaths were ascribed to influenza and pneumonia, though 534 of the 738 notified cases of pneumonia were treated in hospital. The numbers admitted to Barshaw maternity hospital—326 for confinement and 166 to the antenatal wards—taxed the accommodation, and extra sessions and an increase of staff are required to enable a postnatal clinic to be established. The maternal mortality was the lowest on record, with no deaths from puerperal sepsis. The dental clinic was attended by 64 mothers and 369 pre-school children. According to Mr. A. M. Marshall, the senior dental surgeon, the condition of the teeth of the school entrants is still deplorable and his work would be much more effective if more time and money were spared for the pre-school child. He estimates that 5000 children enter the Renfrewshire schools annually with 20,000 teeth requiring treatment. Only 48 persons died of pulmonary tuberculosis, giving a rate lower than ever before, but 40 deaths occurred from non-pulmonary tuberculosis. Little progress was made with the proposed joint county sanatorium.

West Gloucestershire United Districts.

The rural districts of East Dean, Gloucester, and Lydney, and the urban districts of Awre, Newnham-on-Severn, Westbury-on-Severn, and Coleford (added in 1926) comprise the area under the control of Surgeon-Captain O. W. Andrews. It is hoped that by the end of 1930 water will be laid on to the houses in most parts of Coleford and West Dean. Newnham Urban District Council has taken over the proprietary water-supply, which is to be augmented by the driving of an adit into the hillside. A table shows that the death-rate from tuberculosis has been reduced from about 1·0 to about 0·5 since 1913, but that from cancer has risen during the same period from about 0·8 to 1·5. Surgeon-Captain Andrews is an advocate of sterilisation for the mentally deficient. Housing has made progress in the districts most in need, whilst in certain parts of the area the population has declined. The advantage of the keeping of goats by poorer families living near a common is emphasised, with especial reference to those districts where all the milk is bought up by factories.

The Isle of Sheppey Joint Districts.

This area includes: Sheerness (p. 16,890), Queenborough (p. 3189), and Sheppey (p. 5656). Dr. W. C. D Hills states that there are no hospitals in the island, with the exception of the poor-law institution at Minster, which it is hoped will soon be converted into a general hospital with maternity wards. The bridge connecting the island with the mainland has been made free from tolls. Eight cases of small-pox occurred in Sheerness and three in Sheppey. The three districts are, to some extent, combining their sewerage arrangements. The housing question is an important one in Sheerness, which also needs a public supply of hot baths. Anti-mosquito work is in constant operation in all three districts included in this area. The maternity and child welfare work in Queenborough has been transferred to the county and a local nursing association has been established with a district nurse-midwife resident in the borough. Antenatal consultations have made a beginning. The increasing urbanisation of part of the rural district makes greater attention to the water-supply necessary.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 26TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 109 (last week 126); scarlet fever, 1750; diphtheria 1278; enteric fever, 113; pneumonia, 467; puerperal fever, 33; puerperal pyrexia, 99; cerebro-spinal fever, 16; acute poliomyelitis, 17; acute polio-encephalitis, 2; encephalitis lethargica, 14; continued fever, 1; dysentery, 14; ophthalmia neonatorum, 11. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 29th–30th was as follows: Small-pox, 221 under treatment, 4 under observation; scarlet fever, 1809; diphtheria, 2000; enteric fever, 35; measles, 259; whooping-cough, 84; puerperal fever, 28 (plus 15 babies); encephalitis lethargica, 120; "other diseases," 24. At St. Margaret's Hospital there were 16 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 3 (1) from enteric fever, 22 (7) from measles, 7 (1) from scarlet fever, 12 (2) from whooping-cough, 39 (9) from diphtheria, 42 (10) from diarrhœa and enteritis under two years, and 17 (3) from influenza. The figures in parentheses are those for London itself.

Four of the deaths from diphtheria were in Liverpool, 3 in Manchester, and 2 each at Bristol, Chester, Halifax, Leeds, and Sunderland. Four deaths from diarrhœa were reported from Birmingham, 3 from Coventry, and 2 each from Nottingham, Manchester, Salford, and South Shields.

The number of stillbirths notified during the week was 267 (corresponding to a rate of 40 per 1000 births), including 50 in London.

CORRESPONDENCE

THE TREATMENT OF PULMONARY TUBERCULOSIS IN SWITZERLAND.

To the Editor of THE LANCET.

SIR,—Dr. Harrison's article deserves a wide popularity for it illustrates a very human failing—that of following the herd. Because treatment in Switzerland is thought to be the best obtainable no trouble is taken to ascertain if this is actually the case, or whether equally good treatment can be obtained in England. Owing to the popularity of treatment in Switzerland people are eager to tell of their cures and reluctant to tell of their failures. The chief criticism I have to offer is that Dr. Harrison's views are expressed too mildly. As the tourist industry in Switzerland is the chief it is exploited to the utmost in the case of patients in a sanatorium. They are regarded as guests in a hotel rather than patients in a hospital, and little attempt is made to treat them with a view to giving the best chance of recovery. To my own knowledge patients are encouraged to go to dances against their inclination, and also to a weekly cinema which would not be a financial success if a sufficient number were not present.

My own personal observations lead me to believe that it is a great mistake that phthisical patients should be banished to a foreign country where home comforts and familiar ways are absent and where a necessarily prolonged treatment is begun under such discouraging conditions.—I am, Sir, yours faithfully,

London, July 28th, 1930. M. G. DAVIS.

To the Editor of THE LANCET.

SIR,—The fresh-air idea is not likely to be given up in the treatment of pulmonary tuberculosis. Fresh air can be found anywhere, but at high altitudes it is rarefied and is rich in actinic rays, independent of direct sunshine. In consequence of the low barometric pressure the blood condition of patients improves. The increase of the red blood-cells is not a temporary one, but remains on descending to the lowlands once again. (In this connexion experiments with anæmic patients are hardly to be mentioned.) Furthermore, the blood tests—sedimentation and differential cell count—show greater and quicker improvement under treatment than at lower altitudes. Physicians who have to deal with tuberculous patients know the importance of this fact and the improved bodily metabolism cannot be overlooked.

Besides the richness of sunshine, the high altitudes offer an unrivalled richness of ultra-violet rays. Even without sun and on snowy days our patients become sun-burnt, and the effect of this ultra-violet radiation on metabolism and the blood condition is very important. The dryness of the air makes it possible for our patients to spend most of the hours in full winter out of doors, even without sunshine, which by the way is present for weeks in full glory at the time when there is only mist and fog in England. It is not true "that 19 out of 24 hours" of each day must be strictly spent within doors. On the contrary, 8–10 hours can be easily spent out of doors in the cold and dry air, and even our bed-patients can be rolled out in their beds on to their balconies during the greater part of the day. During intense cold weather (a rarity) it is, of course, necessary to regulate the closing of doors and windows more than in the lowlands; but one is not obliged to close them entirely. The amount of fresh and good air available at night is more beneficial than a whole roomful of damp, moist, and smoky air in the lowlands. Certainly there are days with bad weather when the open-air cure is restricted, but these are exceptions, and there is hardly a day in winter or summer when a patient cannot be out of doors. And what is happening to the patient in damp England at that time in the winter? Remembering the climate at home English patients are often astonished to hear that out here they can "cure" out of doors in bed and on their chairs in bad weather.

It is only for a very short time during the shortest days of the year that "the sun is only visible over the mountain tops for about five hours a day." How long does the sun at this time appear in England and with what strength? Dry snow and cold are far better than rain and mist in the lowlands just at that time. The same is true of the so-called "snow melting time." The weather then is either beautiful, warm, and sunny, or snow falls, and this is preferable to the treacherous, windy, and damp weather with April showers then prevailing at the low altitudes. The patients in our Swiss sanatoriums can find as much occupation as in the English ones and can watch the winter sports quite well without risk of being debilitated (as Dr. Harrison suggests) by the intense cold on the ice-rinks, &c. They can drive about in the sunny country, play games, hear good music, and have cinema shows even in the sanatorium and—what is certainly very helpful and must not be overlooked—they can mix with people of other nationalities, learn other languages, and understand customs and doings other than those of their home islands. In long years I have never heard any complaint about the "monotony" of the winter landscape, which changes every day. What about the monotony of a sunless misty winter period in England? And the "same dreary tramp along a very ordinary road with the perpetual snow all round" has a lot of variety. All the woods are open for walks, squirrels are playing, birds are flying about, both so tame as to come to one's hand; and one can see people ski-ing and tobogganing. I am told that in some English sanatoriums there is a "variation" of walks, one for Monday, one for Tuesday, one for Wednesday, and so on. Well, is this less monotonous than to know the menu of the meals for each day of the week and with the perpetual damp and cloudy atmosphere around?

Hundreds of physicians knowing the high altitudes and many thousands of patients, are convinced that, though not a panacea, the high altitudes will always have great advantages in the fight against tuberculosis. Apart from the physiological elements there are results to be considered. A great failure—I speak from bitter experience—comes from the fact that often patients who are sent out to our altitudes are ordered back at a certain time regardless of their present condition. Thus English patients who have been doing well during the winter are obliged to break off their treatment too early and grow worse at home. If they were allowed to remain out during the spring and summer they would continue to improve. I cannot over-emphasise the importance of continuous treatment at high altitudes; it is far preferable to "wintering" only.

Large statistics of permanent results—seven, ten, or more years after the termination of the treatment at high altitudes—have been drawn up by Turban, at Davos, by Ruge and Bernstain-Kohan, and by myself, at Arosa, and by others. They speak for themselves. Of course, a larger experience by Dr. Harrison than mine will be welcome; I personally base mine only on 31,000 patients treated at Arosa—patients from countries all over the world. However this small material, together with observations made during travel over nearly the whole world and examination of patients everywhere, has convinced me more and more of the superiority of the treatment of pulmonary tuberculosis at high altitudes. Thousands of records of English patients of mine who had failed to improve in England and have found their healing up here, confirm this my conviction.

I am, Sir, yours faithfully,

O. AMREIN,
Medical Superintendent of the Altein-Sanatorium and the Sanatorium Furka, Arosa.

Arosa, Switzerland, July 26th, 1930.

AMERICAN STUDENTS AT BRITISH UNIVERSITIES.

To the Editor of THE LANCET.

SIR,—I read with a great deal of interest your editorial concerning medical students from the United States in English universities in the June 7th issue of THE LANCET. You will, perhaps, be interested to learn how this situation is viewed by some people in the United States. There are three groups of students who leave the United States to go to English universities to pursue medical studies. The first, group 1, and perhaps the only group actuated by praiseworthy motives, are the post-graduate students. These are men and women who have secured their medical education in the United States, have earned the degree of Doctor of Medicine, and have been licensed to practise. They usually cross the ocean to acquire more knowledge and greater proficiency in a particular preclinical science or specialty. Very often such post-graduate students are sent to London on a scholarship by the hospital in which they have completed their internship. In all instances they are men and women who reflect creditably upon themselves and the institutions in which they carry out their studies.

The remaining two groups (groups 2 and 3) are the undergraduate students. The first of these (group 2) comprises those who have completed their pre-medical requirements and have not as yet begun the study of medicine. The greater majority of these apply for admission to American medical schools. More than can possibly be accepted are eager to gain admittance, and of these those practising the highest grades and greatest promise for success in medicine are accepted. The remaining number must seek education elsewhere. The most natural place is England. They have found from previous experience that when chances of being accepted in an American medical school are gone it is quite easy to gain admission to an English school. Those who are of Italian descent just as readily gain admission to the Italian medical schools. This in no way reflects with any credit on either the English universities or Italian schools. Those of us who have secured our undergraduate medical training in American medical schools regard those Americans who have been educated in English schools as inferior. This is natural, because the English universities have recognised what the American schools have rejected.

There are, of course, those who have always evinced a desire to study only at an English medical school and have applied to no American medical school for admission. Such persons should be admitted, if they possess the right qualifications, to English universities, and if the English schools would limit their choice to such applicants they would gain much in prestige among Americans. It is quite easy to learn just who such persons are. Everyone applying to an American medical school is recorded by the American Medical Association. If he applies to a dozen medical schools this fact is noted as many times. The procedure for the English university authorities to follow would be to write to the American Medical Association regarding any application they received from the United States. If he had applied to American medical schools and had been rejected this fact would be known. They then could refuse admission to such a student. If he had only applied for admission to the British medical school this would also be known to the American Medical Association. The latter type of student is, on the whole, much more desirable. He has not been found unsuitable by the American schools.

The third group of students are those who have had some undergraduate medical training in the United States and who find it impossible to continue their training here. It is then natural for them to apply to English medical schools for the completion of their medical course. This group comprises those who have been expelled either because of poor scholarship or because of serious flaws in their moral make-up. Any medical student expelled from an American medical school has his name sent to the American Medical Association from where it is sent to the deans of the accredited medical schools in the United States. Such a student can never enter another American medical school. There is but one thing for him to do if he desires to continue his medical training, that is to apply to an English medical school

There is a solution to this problem. It should be made a matter of routine of the admitting board of every English medical school to write to the American Medical Association concerning each application they receive from the United States. They would then be in possession of the facts and would be able to decide intelligently just who is worthy of admission to the English medical schools.

Very cordially yours,

July 8th, 1930. EDWARD PODOLSKY.

*** With regard to Dr. Podolsky's group 2 the facts are not in accordance with our experience. It is the considered judgment of those most competent to form an opinion, voiced by Dr. Colwell, secretary of the Council on Medical Education, in a letter to the American Consul in Edinburgh, that "all those who are quantitatively and qualitatively qualified do secure admission to approved medical colleges." That agrees with the statement in THE LANCET published after an investigation made some 18 months ago with the assistance of the deans into the medical curriculum of 12 great American universities. (Special Supplement of THE LANCET on "Medical Education in the United States," Jan. 5th, 1929.) That the rejected naturally obtain education in England does not tally with the experience on this side. For example, of 800 American applicants at the University of Edinburgh in 1930, 11 were accepted, their testimonials being generally in the form of a letter direct from dean to dean. In group 3 there may be many students who apply in this country for admission, but, so far from it

being quite easy, it is quite difficult to learn their records in the absence of Statutory bodies in the United States with whom to communicate. The size and influence of the American Medical Association is not in question, but it has not the necessary constitution to enable it to act in the way suggested. There are, however, in the United States four bodies which might be recognised as having a Federal position, and unhampered by the Doctrine of States Rights. It is to be hoped that in one or other of these directions our General Medical Council may find a way to the institution of that reciprocity for which the members of the Council and leaders of educational thought in America have been working intensively for some time.—ED. L.

THE INTERPRETATION OF DENTAL RADIOGRAMS.

To the Editor of THE LANCET.

SIR,—It is unfortunate that Mr. Pitts, judging from his letter in your issue of July 26th, has not made himself familiar with the literature of his subject or with present-day circumstances. He states "If Dr. Brailsford would refer to Weston Price's book on dental infections, he will find there an instructive chapter on the capabilities and limitations of X rays." May I state that if Mr. Pitts would refer to an article on this subject in the *British Medical Journal* of June 16th, 1928, or the reprints of this article which appeared in the *Dental Surgeon* on July 14th, 1928, in the *Medical Annual* for 1929, and the *Mouth Mirror*, he will see from my criticism that I had read Weston Price's book, but that my experience was not in entire agreement with his conclusions. In this article I stated:—

"Weston A. Price, who with a team of dental surgeons, bacteriologists, and laboratory workers has carried out a very extensive investigation on dental sepsis, considers that 10 per cent. of the teeth with septic roots give no indication of this on the radiograph; but even so, most of the process illustrations which he used in describing the 'failure' of the radiographs showed definite though 'slight' changes, yet process illustrations cannot give the detail of the original radiographs. There is no doubt in my mind that the figure of 10 per cent. can be considerably reduced by skill in the radiographic technique and the care exercised in examining and interpretating the radiograph."

In a further article I stated "Teeth which do not show changes on a good radiograph and which are not painful are not the source of chronic toxic absorption. In other words, every tooth which is a source of chronic toxic absorption shows changes indicating this on the good radiograph."

Every radiologist is acquainted with the fact that dental surgeons do not all hold the same opinion with regard to dental sepsis. Some will act on the radiographic findings and extract teeth only shown to be septic, others will extract teeth with "clinical" signs and ignore obvious lesions shown on the radiograph, others will ignore clinical and radiographic evidence of sepsis and preserve teeth for "appearances" or for the attachment of a denture, yet others will extract teeth which show no definite clinical or radiographic evidence of sepsis. A note of caution regarding the treatment of obscure dental sepsis which I have given in a previous article reads as follows:—

"The reason for the doctor's recommendation for the wholesale extraction of a patient's teeth is based on his experience that such treatment results in the alleviation of certain symptoms. Equal success attends the extraction of only those teeth shown by the radiograph to be septic and probably leaves the patient with most of his or her own teeth and consequently not so liable to the digestive disturbances experienced by many edentulous patients."

Commenting on radiologists' reports Mr. Pitts says "While useful no doubt to the medical practitioner, tell the dentist singularly little." May I make the obvious suggestion that perhaps the latter does not always understand the reports? Their treatment of the lesion sometimes suggests this. For some reason Mr. Pitts thinks that radiologists do not hear the post-extractive findings in patients they have radiographed. He would be very surprised to know how much the radiologist is told, but may I here suggest that the information supplied is not always technically accurate. In my article in the *British Medical Journal* already quoted will be seen a radiogram (No. 9) which show a bulbous hypercementosis of the roots of a molar tooth with definite evidence of septic erosion of the mandible around. This tooth I reported to be septic. The dental surgeon who, in attempting to extract the tooth broke off the crown and left in the septic roots, told the patient that I had made a mistake and that "the tooth was sound otherwise it would have come out easily." My reputation was not re-established with the patient and no further treatment was given, in spite of a toxic arthritis, until the patient had been persuaded with much difficulty to see another dentist, when the septic roots were removed.

The leading article in THE LANCET of July 12th states:—

"It has become a common practice among doctors to send patients to have the teeth radiographed. If the radiograms and the reports which accompany them seem to suggest the existence of infection in the teeth, then the patient is referred to a dentist for the appropriate treatment. This order of procedure has brought with it some unhappy results."

In my experience the "unhappy results" are seen where the dental surgeon has previously taken his own radiographs and has excluded a second opinion which would have supported him in carrying out essential extractions. Radiologists frequently see patients upon whose teeth much time and money have been spent in gold-filling and crowning, and find that many of these teeth show definite evidence of apical sepsis. One can readily imagine that neither the patient nor the dentist is pleased with such a report and that the dentist, as your leader states, "generally prefers to make his own interpretation of them." It has been my experience that an attempt to parry the "unhappy result" is made by adversely criticising the report, telling the patient the radiographs are taken at the wrong angle, taking more radiographs and then ignoring the radiologist's report. Mr. Pitts says "the usual reports obtained from radiologists . . . follow a stereotyped line. They often contain inaccuracies and reveal clearly that the writers of them are ill-acquainted with the elements of the anatomy and pathology of the teeth and jaws." I see no reason why medical men should all be so ignorant of this branch of medicine.

Mr. Pitts's recital of recriminations is pathetic and most readers will agree with his statement that "recriminations of this sort are not very helpful," particularly when they learn that these are among the fallacies which will be found illustrated and described (perhaps in the first instance) in the article to which I have referred. When referring to these fallacies, I stated that—

"the errors in dental radiographic diagnosis may be due to (1) faulty photographic and radiographic technique, (2) misrepresentation of the radiograph due to (*a*) lack of experience in interpreting radiographic shadows, (*b*) lack of knowledge of general anatomy and pathology. As

regards (*b*) there is no question that for the best interpretation of radiographs the observer must have a good knowledge of the normal and pathological anatomy of the part. Most books dealing with the radiography of the teeth instance the interpretation of the mental and palatine foramina and loculi of the maxillary antrum as areas of peri-apical absorption, so that these mistakes are hardly likely to be repeated except by the beginner; even if they are the worst that can happen is the sacrifice of one or perhaps two sound teeth. The result of the wide knowledge of the faulty interpretation of these foramina has no doubt been responsible for the much more grave error which is brought to one's notice from time to time—that is, the interpretation of a definite peri-apical absorption as a normal foramen or sinus. It would seem that the larger the cyst the greater possibility is there of it being interpreted as a shadow of the antrum. This is of great importance because the systemic disease from which the patient is suffering continues or increases in severity as the suspected cause has been overlooked and allowed to remain—there being no local signs apparent to the patient or the clinical observer."

In Mr. Henry's article in THE LANCET of July 5th he states that the antrum "extends sometimes as far forward as the lateral incisor, and is often mistaken for an area of pathological destruction, especially when septa dividing it into loculi are present." Yet Mr. Pitts says, referring to a cyst involving the upper lateral incisor which had been mistaken for the antrum, "Though a very elementary knowledge of the anatomy of the jaws should have made it clear that the antrum does not extend to the incisor region." Here we have the opinion of two men "who have knowledge of the structure of the teeth and jaws" not quite agreeing with one another. Members of the medical profession recognise the usefulness o the independent opinion and the right of the patien to obtain it, and will not lightly accept any treatmen from members of their own or allied professions whic is opposed to it.

I am, Sir, yours faithfully,

JAMES F. BRAILSFORD, M.D.

Birmingham, August 2nd, 1930.

THE PROPER STRAPPING OF THE CHEST.

To the Editor of THE LANCET.

SIR,—Referring to Dr. Rudolf's remarks in you issue of July 26th (p. 214), I fully recognise th advisability of having the expiration as full as possibl while the strapping is being applied, but I generall find the shallowness of the breathing caused by th acute pain in inspiration, combined with the pressur of the straps when applied in the manner directed quite sufficient for the purpose. Certainly the strap should run horizontally though, in the female, whe the breast is large, this is difficult. Thankin Dr. Rudolf for his comments,

I am, Sir, yours faithfully,

CHARLES W. CHAPMAN.

London, W., August 2nd, 1930.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

PROROGATION OF PARLIAMENT.

PARLIAMENT was prorogued on Friday, August 1st, until Tuesday, Oct. 28th next. Among the Acts which received the Royal Assent were the Appropriation Act; the Finance Act; the Workmen's Compensation (Silicosis and Asbestosis) Act; the Illegitimate Children (Scotland) Act; the Education (Scotland) Act; the Adoption of Children (Scotland) Act; the Housing Act; the Housing (Scotland) Act, and the Road Traffic Act.

PHYSIQUE AND HEALTH OF THE ARMY.

On Wednesday, July 30th, the House of Commons considered the Civil Estimates and the Estimates for Revenue Departments on Report.

On a vote of £879,000 for the Expenses of the War Office,

Lieut.-Colonel WINDSOR-CLIVE moved to reduce the vote by £100. He said that when the Secretary of State for War introduced the Army estimates earlier in the year he revealed the disquieting information that the Army was 10,000 men under establishment owing to the serious falling off in recruits. Before the House separated for the summer recess it was right that they should know whether there had been any improvement in the situation, and what steps were being taken to remedy the situation.

Lieut.-Colonel HENEAGE seconded the motion for the reduction of the vote.

Mr. T. SHAW (Secretary of State for War) said that the War Office was not faced with any problem so far as the number of men offering themselves was concerned. Overwhelming numbers offered themselves for recruitment, but the problem was to get men who were physically fit. The appalling fact was that something like 61 per cent. of those who offered themselves had a reduced standard of height, chest measurement, and dental requirement. That fact ought to induce every Member of the House to do his best to tackle this problem of national physique, because if the race deteriorated no army in the world could sav us from going down.

Earl WINTERTON asked if our Army standard wa not one of the highest in the world.

Mr. SHAW said that might be so, but he was nc at the moment concerned with other countrie During the nine months of the present year 19,21 recruits were taken in. The last month showed a increase over the previous figures, but compare with the numbers who had offered themselves thi number was small. Probably the war and the limita tion in the number of births during that period migh be responsible to some extent for the present situa tion. He thought, however, that it was right t assume that there were millions of men in the countr who did not believe in the Army; they would neve join it voluntarily, and would only take up arms i a grave national emergency. He would speak wit the utmost plainness. The present Governmen would not be responsible for attempting either t reduce the unemployment benefit or to make it mor difficult to get it, because recruits were not comin into the Army. He thought that the question c unemployment pay had relatively little to do wit whether a man offered himself for the Army or not He did not doubt that the peace propaganda had tremendous effect in that direction. That was inevit able, and again the Government could not be asked for the sake of recruiting, to deviate one inch fron their peace policy, or from the principles which the had always declared in regard to peace. He saw n need for panic in regard to the recruiting questio but he agreed that the problem had to be tackle The medical side of the service was understaffe Judging from the information he had received fror reports and data kindly given to him by some of th distinguished men in the medical profession it wa quite evident that that was the case, and the reaso he was told was that the terms were not good enoug

Sir L. WORTHINGTON-EVANS said that he mus warn Mr. Shaw that he must not take consolatio from the idea that he was going to get quickly better type of recruit than was coming forward a the present moment. When he had dealt with th

public health side, and removed some of the underlying causes of ill-health among the population, there might be an improvement, but that would not affect recruiting next year or the year after. What they had to do was to maintain each year, not waiting for a longer period, the numbers of recruits going into the Army.

THE STANDARD OF PHYSICAL FITNESS.

Dr. VERNON DAVIES said that the fact that, although the height standard for the Army was now only 5 feet 2 inches, 61 per cent. of the candidates failed to reach the physical standard, showed that there were in the country to-day a very large number of young men who could not be described as physically fit. He (Dr. Davies) would not suggest that any one should be taken into the Army who was not organically sound, but he wondered whether the test could not be made a little lighter in respect to height, chest measurement, or dental requirements. Many of these men had perhaps been brought up in circumstances of great poverty, under slum conditions, and had not had any chance to live a healthy life in the open air with plenty of good food. If they had that chance they might develop physically and become really good strong healthy men, a credit to themselves and the country. The point about which he (Dr. Davies) was principally concerned was the shortage of medical officers. The Secretary of State for War had informed him that at present the shortage amounted to 140. It was no use having an Army, however small, unless it was healthy, and the only way to secure that was by having a sufficient and efficient medical staff. Mr. Shaw had indicated the vital point—namely, money. The medical man was worthy of his hire. More and more medical men every year were being attracted into the public medical services which offered very great inducements to the best type of man. A hospital medical officer got £600 and a senior medical officer from £750 to £1000. A medical officer to a port sanitary authority was offered £800, a district officer for tuberculosis £750 a year, and the medical superintendent of an institution got from £750 to £1000. The best men were taking up these appointments and the Army was suffering accordingly. If the Army offered sufficiently good terms it would get the medical officers it required. There was another method. The Government employed a large number of medical men in the various public departments. Would it not be possible to arrange that any medical man who had been in one of the services should have a preferential claim to any appointment in the Government Medical Service or under a municipality? The Secretary for War would not have to ask the Chancellor of the Exchequer for very much more money. The position was serious, and it was an urgent necessity that the Secretary of State should see that the medical services of the Army were recruited up to their proper strength.

The motion to reduce the vote was negatived without a division.

HOUSE OF COMMONS.

WEDNESDAY, JULY 30TH.

Tuberculosis in the Navy.

Dr. VERNON DAVIES asked the First Lord of the Admiralty if there had been any increase in recent months in the percentage of cases of tuberculosis which had been granted pensions on account of attributability to the conditions of service.—Mr. ALEXANDER replied: During the past six months 70 per cent. of those invalided for tuberculosis have been granted attributable pensions. This compares with 68 per cent. in the case of those invalided during the year 1929.

Sick Berth Arrangements at Plymouth Naval Hospital.

Mr. HORE-BELISHA asked the First Lord of the Admiralty whether his attention had been drawn to the system of summer leave during the summer leave period (August 1st to 22nd) for the sick-berth staff of the Royal Naval Hospital, Plymouth; and whether, seeing that, owing to shortage of labour, some of the staff would have to be continuously on duty for 13½ hours per day with a possibility of a further four hours' night watch in the event of an accident or serious case being received in the hospital, he would consider whether better arrangements could be made.—Mr. AMMON (Parliamentary Secretary to the Admiralty) replied: Owing to the exigencies of fleet requirements the sick-berth staff of the Royal Naval Hospital, Plymouth, is temporarily short of the authorised numbers. It is also inevitable that during long leave extra work falls on ratings who are not on leave, but no member of the staff is continuously on duty for as long as 13½ hours.

Medical Services in India.

Lieut.-Colonel FREMANTLE asked the Secretary of State for India when he expected to have the views of the Government of India as to the proposed formation of an Indian medical council, and as to the admission to the Indian Medical Service of candidates not holding qualifications recognised by the General Medical Council; and whether, in view of the hardship caused to students now becoming qualified in India, who were thereby losing the advantages of British registration, and the importance of these matters to the welfare of Indians and Europeans in India, and in order to secure its earliest consideration by parties and persons interested, he would publish the reply without delay.—Mr. WEDGWOOD BENN replied: I have not heard when the Government of India expect to be in a position to send me their views, but I have no doubt that they will deal with the matter as expeditiously as possible. I cannot undertake to publish the reply of the Government of India before I have seen it, but I will bear the hon. Member's suggestion in mind.

Laboratory Diagnostic Service for Insured Persons.

Dr. VERNON DAVIES asked the Minister of Health if he was aware that Section 4 of the National Health Insurance Act, 1928, which precluded insurance committees from making grants unless the Minister was satisfied that they were of an eleemosynary character, would abolish next December the laboratory diagnostic service of the Lancashire insurance committee which since 1926 had provided out of local funds a free laboratory diagnostic service for 800,000 insured persons in Lancashire at a cost of less than one farthing per head; and, in view of the importance of such a service to the public health, would he delete the word eleemosynary from Section 4 above mentioned.

Mr. RAMSBOTHAM asked the Minister of Health whether he was aware that, under Section 4 of the National Health Insurance Act, 1928, the Lancashire insurance committee was now precluded from making grants necessary for the continuance of the laboratory diagnostic services in Lancashire; and whether, seeing that the entire community was in favour of such grants being made in view of the valuable work carried out by these services, he proposed to introduce legislation at an early date to alter the law so as to leave the making of grants within the unfettered judgment of the Minister of Health.—Mr. GREENWOOD replied: I am aware that the National Health Insurance Act passed in the late Parliament will produce the effect to which the hon. Members refer. Alternative means of securing services of this character have been suggested to representatives of the committee, but I cannot undertake to propose an amendment of the law on the point.

Working Days Lost Through Sickness.

Mr. DAGGAR asked the Minister of Health the number of working days lost through sickness for each of the years 1921 to 1929 inclusive.—Mr. GREENWOOD replied: I can only give particulars with regard to persons insured under the National Health Insurance Acts. The following Table, which refers to England and Wales, shows the approximate number of weeks for which sickness and disablement benefits were paid under the National Health Insurance Acts during each of the years from 1921 to 1929:—

Year.	Million weeks.	Year.	Million weeks.
1921	19	1926	28¼
1922	19½	1927	30½
1923	20½	1928	26¾*
1924	23¼	1929	29½
1925	25		

* As from Jan. 2nd, 1928, the age at which sickness and disablement benefit ceased to be payable was reduced from 70 to 65.

THURSDAY, JULY 31ST.

Accidents in Demolition Work.

Mr. DAY asked the Home Secretary whether his attention had been called to several recent accidents to workmen caused by the demolition of old buildings; and whether he would consider strengthening the existing law or the

protection of workmen engaged on such work.—Mr. CLYNES replied: I do not know to what accidents the hon. Member specially refers, but a number of accidents to persons employed in the work of demolition have come to the notice of the Factory Department during recent months. The present Factory Act provides only for the protection of those employed in construction or structural repair of buildings, but it is proposed in the Factories Bill to include demolition.

Mental Treatment.

Mr. ROBERT RICHARDSON asked the Minister of Health whether, in accordance with the suggestion of his Parliamentary Secretary, made in response to the wishes of the Standing Committee on the Mental Treatment Bill, certain places would be set apart to give separate accommodation to voluntary boarders; how many of the hospitals which had hitherto been poor-law infirmaries will be utilised for that purpose, so that those who had voluntarily submitted themselves to treatment should not be housed in the same institutions as the certified; and how many hospitals (particularising general or mental) had started out-patient clinics for mental cases.—Mr. GREENWOOD replied: I would remind my hon. friend that the Mental Treatment Bill only received the Royal Assent on the 10th of this month, and does not come into operation until Jan. 1st, 1931. The Board of Control have already conferred with representatives of the local authorities in regard to some of the more important provisions of the Act; but until local authorities have had a reasonable opportunity of considering and determining the steps to be taken in their areas when the Act comes into operation, it is not possible to give the information asked for in this question.

Mr. RICHARDSON asked the Minister of Health what progress had been made in the drafting of the Bill to do away with the differentiation hitherto existing in the procedure of certification in the case of the so-called pauper as compared with the private patient.—Mr. GREENWOOD replied: In the course of the consideration of the recommendations of the Royal Commission notes were prepared on the clauses that would be required to effect an assimilation of the procedure for the certification of rate-aided and private mental patients. But no steps have been taken towards the drafting of a Bill because it is not practicable at present to undertake further lunacy legislation.

Mr. RICHARDSON: Was not a promise made to do this when the Bill was in Committee?

Mr. GREENWOOD: No; I said that we were obtaining all the evidence, but I held out no hope of further legislation.

Chemists and Health Insurance Prescriptions.

Mr. GOULD asked the Minister of Health whether, with regard to the report received from the Somerset health insurance committee, in which it was stated that certain chemists had been dispensing in a very lax way under the National Health Insurance Act, and that in one case a deficiency of 69 per cent. of the drugs as prescribed by the medical practitioner was dispensed to the patient, he would say what action he proposed to take in this matter.—Mr. GREENWOOD replied: The report which I understand that my hon. friend has in mind was received yesterday, and any case of failure to comply with the terms of service applicable to insurance chemists will be dealt with in due course in accordance with the Medical Benefit Regulations.

Mr. GOULD: As this report has been given considerable publicity in the Press, and has left a very bad impression in the minds of the patients in regard to the quality of the dispensing, will the right hon. gentleman consider the report and take action in regard to those who maladminister the Act?

Mr. GREENWOOD: There is no delay on my part. There is a definite procedure to be followed under the Regulations in regard to my intervention, but I am afraid that point has not been reached.

Home for Mental Defectives.

Mr. THOMAS WILLIAMS asked the Minister of Health whether he had yet sanctioned the purchase of Brandonburton Hall by the East Riding (Yorks) County Council as a home for mental defectives; and, if not, before so doing, if he would take into consideration the unsatisfactory situation of this hall and the fact that the site was only 11 feet above sea-level.—Mr. GREENWOOD replied: I have already given provisional approval to the proposal made jointly by the East Riding Council County and York City Council to purchase Brandonburton Hall and 98 acres of land for mental deficiency purposes. The estate was inspected on behalf of the Board of Control who are satisfied that it is suitable for the purpose in view. Such inquiry as I have been able to make in the time available does not support the statements in the latter part of the question.

Patent Medicine Duties.

Mr. LEIF JONES asked the Chancellor of the Exchequer the annual sum received from patent medicine duties; he was aware that the Board of Customs and Excise ha granted exemption from such duty to proprietors of pater medicines in cases where the formula was disclosed and n proprietary right to the preparation was claimed, notwit standing the fact that such proprietors had in the pa advertised and were still advertising that their preparatio prevented or cured illness; and what was the loss of reven due to this exemption.—Mr. SNOWDEN replied: The n amount of medicine stamp duty received in the year end March 31st, 1930, was approximately £1,834,200. Figur for the previous ten financial years may be found in Table III page 11, of the twentieth report of the Commissioners Customs and Excise. (Command paper 3435.) As regar the second part of the question, there is a statutory exem tion from the duty in favour of "known, admitted ar approved" remedies, when sold by duly qualified doctor chemists or druggists, in which no proprietary right claimed, and claims for such exemption are admitted pr vided that a definite and complete statement of the actu ingredients—i.e., the full formula with proportions—and statement that no proprietary rights are claimed in t preparation of the medicine are printed in a legible ar conspicuous manner on all labels, cartons, &c. Followi the decision of the courts in the case of Farmer *v.* Gl Jones in 1903 exemption has not been refused on the grou that known, admitted, and approved remedies have be recommended for the prevention or cure of illness. T cost of this exemption cannot be stated.

FRIDAY, AUGUST 1ST.

Medical Examination of Canadian Emigrants.

The Earl of DALKEITH asked the Secretary of State f Dominion Affairs if his attention had been called to cas in which would-be Scottish emigrants to Canada had so up all they possessed, been passed as fit by medical m in this country, had been rejected at the port of arrival, a returned to Scotland in a state of destitution; and wheth he would consider, in conjunction with the Canadian auth rities, some better system of supervision and control, which there should be a medical authority on this si who had the definite responsibility of saying whether person was or was not fit to emigrate.—Mr. THOMAS replie In order to prevent as far as possible the occurrence of cas of the description referred to by the noble lord all migra from the United Kingdom to Canada are medically examin in this country prior to their departure by a medical offic appointed by the Canadian Government. Under t Canadian immigration law a final medical inspection tak place on the arrival of a migrant in Canada, and in the ve great majority of cases the preliminary medical examinati is confirmed. In a few exceptional cases, however, genera through changes which have taken place since the preli nary medical examination, migrants are refused admissi to Canada as a result of this final medical examinatio but I am satisfied that the Canadian authorities take possible steps to prevent the occurrence of cases of t description.

EAST SUFFOLK AND IPSWICH HOSPITAL.—La year 4721 in-patients were treated to a conclusion; £3 4*s.* 10*d.* each per week their individual total cost w £8 17*s.* 4*d.* Their average stay was 19·22 days. There we 18,222 new out-patients, who made 81,462 attendanc The income—£54,277—was a record; the contributo scheme produced just over £31,000, an increase of ov £1500. The patients' breakfast hour has been altered fr 6 A.M. to 8 A.M.

NOTTINGHAMSHIRE ISOLATION HOSPITALS.—T public health committee of the Nottinghamshire cou council reports that the hospital accommodation the treatment of infectious diseases, other than small-p is sufficient for little more than one-third of the popu tion of the county, and that not less than 200 additio beds are required. They therefore recommend the erecti of one large central hospital of 200 beds. The proporti of the population for which there is no satisfactory sm pox accommodation approaches a quarter of a milli and it is recommended that not fewer than a further beds should be provided, with faculty for extension. I further suggested that all the arrangements for the treatme of infectious disease should be unified, and that the cou should be constituted as one isolation hospital area, wh involves the transfer to the county council of all existi local isolation hospitals. The recommendations were adopt and a scheme is to be prepared for carrying them out.

MATERNAL MORTALITY AND MORBIDITY.

INTERIM REPORT OF DEPARTMENTAL COMMITTEE OF THE MINISTRY OF HEALTH.[1]

THREE years ago Mr. Neville Chamberlain, then Minister of Health, appointed a Departmental Committee to advise upon the application to maternal mortality and morbidity of the medical and surgical knowledge at present available, and to inquire into the needs and direction of further research work. Sir George Newman was made chairman and Dr. Margaret Hogarth secretary, the other members being Prof. F. J. Browne, Dame Janet M. Campbell, Dr. Ethel Cassie, Dr. Leonard Colebrook, Prof. Archibald Donald, Dr. C. E. S. Flemming, Sir Walter Fletcher, Dr. Harold Kerr, Dr. W. H. F. Oxley, Prof. Miles H. Phillips, Dr. C. E. Tangye, and Dr. O. L. V. S. de Wesselow. Owing to illness Dr. Margaret Hogarth was unable to undertake the secretaryship, which devolved on Dr. Jane H. Turnbull. This committee has now submitted an interim report. After a brief introduction the chapters are concerned with a report of the maternal death investigation, abortion in relation to maternal mortality, puerperal sepsis, antenatal care, the use of anæsthetics and analgesics in obstetric practice, medical education in obstetrics, a report on a national maternity service, and conclusions and recommendations. Appendices include reports from the Royal College of Physicians, from the British College of Obstetricians and Gynæcologists, and from a subcommittee of the British Medical Association on anæsthetics in confinements; memoranda on the sterilisation of the hands and on the need for bacteriological services in the control of puerperal infections, by Dr. Leonard Colebrook and Dr. F. Griffith, and a memorandum on antenatal clinics; and a copy of the death inquiry form of the Maternal Mortality Committee.

One of the most important sections of the publication is the

Report on Maternal Death Investigation.

A form of inquiry was drawn up by the committee, and the medical officer of health of the appropriate local authority was invited to be responsible for the completion of the forms. It was suggested by the Ministry that a consultant or a specially qualified practitioner should be nominated to assist the medical officer of health in cases of unusual difficulty, and in some areas this suggestion has been adopted.

The preliminary scrutiny and classification of the forms on lines laid down by the committee were entrusted to two medical examiners appointed by the committee for this purpose—Mr. G. F. Gibberd, obstetrical and gynæcological registrar, Guy's Hospital, and Mr. Arnold Walker, assistant obstetric surgeon, the City of London Maternity Hospital. The committee express appreciation of the accuracy, industry, and good judgment with which they have carried out the onerous and difficult task of preparing the records, of which 3079 were received between November, 1928, and April 30th, 1930. It is estimated that about two-thirds of all the maternal deaths in England and Wales are now coming before the notice of the committee. In this interim report the first 2000 cases only are considered.

[1] H.M. Stationery Office. 1930. Pp. 151. 2s.

The analysis made of these cases has been purely clinical and administrative. They have been divided into two classes—a first group comprising deaths directly due to pregnancy and childbearing (including abortion and ectopic gestation) and numbering in all 1596, and a second group comprising deaths due to an independent disease, concurrent with pregnancy or childbirth, in which childbearing contributed to or accelerated death or was present merely as an incident. In this group there were 404.

DEATHS DIRECTLY DUE TO CHILDBEARING.

The 1596 deaths attributed directly to childbearing have been divided into the following subclasses, which have been based on clinical rather than pathological causes of death.

TABLE I.

		Per cent.
1. Sepsis	616	38·6
2. Eclampsia	218	13·6
3. Operative shock, &c.	145	9·0
4. Antepartum hæmorrhage	125	7·8
5. Postpartum hæmorrhage	92	5·7
6. Other toxæmias, including chorea and mania	99	6·2
7. Embolism	113	7·0
8. Abortion	168	10·5
9. Extra-uterine gestation	20	1·2
Total	1596	

These figures may be studied in connexion with the following table from the Registrar-General's Returns for 1928, though the groups do not and cannot exactly correspond. There is sufficiently close correspondence in the percentages to suggest that the deaths investigated by the committee are fairly representative of the whole number occurring in England and Wales.

TABLE II.—CAUSES OF DEATH AS RECORDED BY REGISTRAR-GENERAL IN 1928.

		Per cent.
Abortion	77	2·60*
Ectopic (extra-uterine) gestation	86	2·90
Other accidents of pregnancy	106	3·60
Puerperal hæmorrhage	331	11·30
Other accidents of childbirth	331	11·30
Puerperal sepsis	1184	40·50
Puerperal phlegmasia alba dolens not returned as septic	31	1·00
Puerperal embolism and sudden death	188	6·40
Puerperal albuminuria and convulsions	557	19·00
Childbirth not assignable to other headings	21	0·72
Puerperal diseases of the breast	8	0·27
Total	2920	

* Other than those due to sepsis and excluding criminal abortion.

In some instances, in view of all the information at its disposal, the committee has thought fit to assign the death to some cause other than the one entered on the death certificate.

Certain clinical points of interest have emerged from the reports.

Sepsis.—The 616 deaths from sepsis have been divided into three classes: (1) Sepsis following ordinary normal labour (294 cases); (2) sepsis following delivery by low forceps, labour being otherwise normal (47 cases); and (3) sepsis following complicated labour (275 cases). Classes (2) and (3) have been differentiated because the frequency with which delivery is effected in private practice by means of the forceps is such that the committee considered that it would be inaccurate to classify all such cases as complicated labour. In all the cases included in class (2) there seemed to be no particular reason for the operation beyond slight delay during the second stage of labour. In the majority of the deaths which followed normal labour there was no positive evidence of any mismanagement during delivery, but the records are not always explicit, and at some stage in many of these cases there is likely to have been some failure to exercise due care which was ultimately responsible for a fatal issue.

Amongst the 616 deaths from sepsis the nature of the antiseptic used was the subject of investigation. In 305

cases lysol alone was used, in 92 cases mercury preparations, and in 219 cases other antiseptics (or unstated). In few of the reports on fatal cases of sepsis have the scheduled questions under "disinfection" have been answered in detail. Serious lack of adequate antiseptic precautions—whether due to ineffective antiseptic solutions or to carelessness in utilising antiseptics—is held to account for the morbidity in many of the cases. The whole question of the adequate disinfection of the hands and instruments of the professional attendants as well as of the surroundings and person of the patient, is one which deserves, and indeed necessitates, far more attention than it apparently receives.

Certain other features of the deaths attributed to sepsis are of interest. For example, the day of onset of pyrexia was recorded in 544 cases, and in 66 per cent. of these it was observed within the first three days; this confirms the general impression that patients who escape a rise of temperature during the first three days are less likely to do badly. The duration of the illness was noted in 607 cases. It was under one week in 276, from one to two weeks in 182, and longer than two weeks in 149. Here again the findings confirm the impressions of most doctors. Another observation, however, will be a surprise to some practitioners. The duration of labour was over 24 hours in only 97 cases out of 307 in which a note was made on the point. It appears from these figures that prolonged labour is not in itself dangerous, and that patients and their friends should be educated to believe this.

Eclampsia.—Under this heading are included all cases of toxæmia in which convulsions or fits occurred. They numbered 218. In 105 cases the urine was tested with some degree of regularity. In 43 of these no albumin was found, but as the date of the last examination of urine was given in very few cases, the conclusion that albumin was in fact absent until the onset of symptoms cannot fairly be drawn. In 62 albumin was found. Of these, very few received treatment in accordance with the best modern practice and in 41 treatment was definitely deficient. In 113—i.e., over half the cases—the urine was either not tested at all or was tested only occasionally. In only 23 cases is there a record of blood pressure having been taken before the onset of fits.

The committee consider that eclampsia is almost entirely a preventable disease, provided (*a*) that urine and blood pressure tests are made regularly and with sufficient frequency throughout pregnancy, and (*b*) that adequate and prompt treatment is carried out should an abnormality arise. In this series 51·7 per cent. of the deaths from eclampsia are attributed primarily to non-detection of the albuminuria, and the committee hold that efficient antenatal examination would probably have enabled the fatal result to be avoided. Amongst the cases where albumin was detected, the committee were impressed by the comparatively frequent absence of competent treatment and particularly by the failure to secure admission to hospital. Only in 21 out of 218 cases was the treatment really satisfactory. The futility of attempting to treat a pregnant woman with albuminuria in her own home, where she has her household duties always before her, is emphasised. The committee consider that the provision of more hospital beds for antenatal observation and treatment of such patients would save much morbidity and many lives every year. Information as to methods of treatment adopted was not sufficient to enable any conclusions to be drawn. The committee express surprise, however, to find that accouchement forcé is still practised in the treatment of cases of eclampsia and of antepartum hæmorrhage.

Ante- and Post-partum Hæmorrhage.—125 cases died from antepartum and 92 from postpartum hæmorrhage. In the vast majority of cases there had been a warning hæmorrhage some days (often some weeks) before the fatal hæmorrhage, and had this been heeded, and the patient removed to suitable surroundings, the fatal result might well have been avoided in many cases. Usually the failure to take heed lay with the patient—in a few cases the doctor or midwife had considered the premonitory bleeding of no importance, and in some cases, although the potential seriousness had been recognised, institutional treatment was not available. In cases of antepartum hæmorrhage treated in the patient's own home, the comparative rarity with which injections of saline solution were given by intravenous or even subcutaneous methods or administered per rectum is held to be significant. In no case of postpartum hæmorrhage reviewed was a blood transfusion given, and in only a small proportion was subcutaneous, intravenous (10 cases), or rectal (20 cases) saline used. Thus in 62 cases no attempt whatever was made to replace body fluids except by the mouth.

Brief notes are given in respect of the deaths due to other toxæmias, embolism, abortion, extra-uterine gestation. The committee consider that many of the 112 deaths following Cæsarean section could have been avoided had proper antenatal care and foresight during labour been available, or had the operation been performed before the birth canal had become infected.

DEATHS NOT PRIMARILY DUE TO PREGNANCY.

Out of the total of 2000 deaths, 404 were returned as attributable to concurrent disease associated with childbirth as follows :—

TABLE III.—INCIDENTAL DEATHS.

Lung diseases (not tuberculosis)	153
Heart disease	98
Chronic renal disease	40
Pulmonary tuberculosis	26
Cerebral hæmorrhage	18
Scarlet fever	4
Unclassified	65
Total	404

The committee were impressed by the general lack of facilities for adequate treatment and management during pregnancy and labour of a woman who is seriously ill with intercurrent disease. In heart disease, in pulmonary tuberculosis, and in chronic renal disease there is an urgent need for accommodation in institutions which would require a medical staff competent in obstetrics as well as general medicine.

The "Primary Avoidable Factor."

The committee have carefully analysed all cases of deaths directly due to childbearing, with the exception of those due to abortion and ectopic gestation, with a view to ascertaining whether death was inevitable, or might have been avoided in more fortunate circumstances. In this connexion the difficulty of correct interpretation by the committee of the information given in the reports has had to be faced. They have, however, felt it to be their duty to note, in every case in which the available information, after being carefully considered, appeared to warrant it, a "primary avoidable factor" in the train of events which led up to the fatal result.

In considering these cases the committee have not had in mind an ideal procedure totally impracticable at the present time in domestic midwifery. They have adopted for convenience a common-sense standard which, though arbitrary, they consider should be attainable with the present personnel and under existing general social conditions, at any rate in areas within reach of consultant and hospital services. It is on this agreed standard (set out in the report) that the records have been analysed.

In summarising the conclusions with regard to the primary avoidable factor, the committee have been forced to use a numerical method because it seems to be the only one that lends itself to the task, and not because they think there is anything approaching mathematical accuracy in their conclusions. They are anxious to emphasise that wherever a figure is quoted in the following summary, it is meant to be a convenient index of a matter of opinion, rather than a precise observation on a mathematical certainty. The committee have made a broad general analysis of the deaths due to pregnancy or childbearing with a view to the discovery of a "primary avoidable factor," with the following result :—

Group 1. Cases showing a primary avoidable factor	6
,, 2. Cases in which no departure from established practice having a causal relationship to the death has been found	6
,, 3. Cases not strictly relevant to this part of the investigation—viz., abortion and extra-uterine gestation	1
,, 4. Cases in which the information was insufficient	1
Total	15

In other words, the committee find as a result of inquiry into these deaths that in 39 per cent. of the total number occurring as the direct result of child

irth the data obtainable indicate a primary avoidable ause. When the "irrelevant" cases and the cases ith insufficient information are excluded the net ercentage of preventable deaths is as high as 48, iat is, nearly half the cases showed a primary voidable factor. These avoidable factors have been ibdivided under four headings: (*a*) omission or iadequacy of antenatal examination, (*b*) error of idgment in the management of the case, (*c*) lack f reasonable facilities, and (*d*) negligence of the atient or her friends.

OMISSION OR INADEQUACY OF ANTENATAL EXAMINATION.

The committee have limited this group to cases iowing complete absence of proper antenatal care. i most of the instances the responsibility rested on ie patient, but it is also evident that the quality of ie supervision given leaves a good deal to be desired. aulty antenatal care was considered to be the rimary avoidable factor in 226 of the 626 cases in his group (36 per cent.). In 157 of these cases the octor or midwife responsible for the care of the atient had failed to make any antenatal examination t all or the patient had given them no opportunity o do so. And in 69 others antenatal examination iled to detect a gross abnormality which must ave been present. These cases are set out in the llowing tables (A and B):—

TABLE A.

Absence of antenatal examination.

ie doctor was responsible in	28
midwife ,, ,,	20
patient ,, ,,	109
	157

TABLE B.

Failure of antenatal examination to detect an abnormality.

Examination by doctor	37
,, ,, midwife	13
,, ,, clinic or hospital	19
	69

ERROR OF JUDGMENT.

Such errors of judgment as bear little or no refer-ce to the event of death have not been ascribed as primary avoidable factor.

Errors Attributed to Midwives.—The greatest number of ors which had a direct bearing on the fatal termination the case were naturally attributed to doctors, as on them sts the ultimate responsibility for all conditions showing departure from normal. For this reason it is recognised at deductions based upon a comparison of mortality-es in the practice of doctors and midwives respectively ay be entirely misleading. Not only is the midwife liged in all abnormal cases to send for medical aid, but e is also bound by her rules to refuse to undertake alone ase in which, from the history or from some other indica-n, abnormality appears probable. Thus the midwife s not the same opportunity of exercising an independent dgment, and can always call for assistance when in ubt. The 57 cases where the fatal termination is con-dered to be due primarily to error of judgment on the rt of the midwife were almost entirely cases of contra-ntion of her rules. The small remainder were nearly all amples of gross ignorance, and the midwife was usually und to be much too old for her work.

Errors Attributed to Doctors.—These occurred chiefly in miciliary practice, though there were a few clear instances mismanagement of cases admitted to hospital. In this nnexion regard should be paid to the handicaps under hich the general practitioner works in obstetric cases; he as for long acquiesced more or less unwillingly in this satisfactory position. Surprisingly good results are ten obtained in untoward circumstances, but not infre-ently the doctor attempts the impossible, and the case ds in a tragedy. Again, unless labour is relatively rapid, may find himself pressed by the patient and her relatives expedite delivery, other urgent work may be awaiting m, and there is often a strong temptation to hasten the se, even though he may be conscious that in so doing a eater or less degree of departure from the path of sound idwifery is entailed.

In nearly one-third of the cases classed as errors of dgment on the part of the doctor, the mistake was ematurе application of the forceps. In many of ese delivery was not effected, and the patient was ultimately sent to hospital where incomplete dilatation of the cervix or disproportion was usually found to be present. Other examples of common error are failure to treat a toxæmia of pregnancy, and the neglect of early warning hæmorrhage in placenta prævia.

Error of judgment on the part of the doctor or midwife or hospital was assigned as the primary avoidable factor leading up to the death of the patient in 224 cases (35·7 per cent. of the group of 626 cases), and these cases are analysed in the following table:—

TABLE C.

Errors of judgment.	Doctor	Hospital.	Midwife.	Total
Treatment of severe toxæmias of pregnancy faulty or absent ..	27	9	7	43
Neglect of warning hæmorrhages	17	2	5	24
Improper use of forceps.. ..	41	4	—	45
Faulty treatment of third stage of labour	16	2	9	27
Non-recognition of obstructed labour	8	2	10	20
Gross errors in the prevention or recognition of sepsis	7	2	14	23
Miscellaneous	30	—	12	42
Total	146	21	57	224

LACK OF REASONABLE FACILITIES.

In this class are included cases in which the absence of skilled assistance was the primary cause in the death, cases conducted in abnormal surroundings, such as delivery in a cowshed, instances of women living in remote and isolated situations, and one or two examples of extreme overcrowding. Poverty and uncleanliness, although unfortunate accessory factors, have not, so far as can be ascertained from the reports, borne any direct relation to these deaths.

Lack of reasonable facilities was considered to be the primary avoidable factor in 64 cases. Only a few of the deaths could be attributed to difficulty in obtaining medical assistance of some sort. In 26 cases it was thought that the most important factor leading to the fatal issue was absence of a second doctor to give an anæsthetic. In 13 cases it seemed probable that if the doctor had had a trained assistant, instead of having to rely in a difficulty upon the inadequate help of a totally incompetent relative or friend, the result would have been different. In 25 deaths it was considered that the most important cause leading up to the death lay in the bad surroundings under which the patient was confined.

Absence of hospital beds and of consultant services had undoubtedly been responsible for death in many cases.

NEGLIGENCE OF THE PATIENT AND HER FRIENDS.

In 112 deaths the Committee considered that the most important cause leading up to the death was absence of sensible coöperation on the part of the patient—in the majority of cases amounting to deliberate refusal to carry out advice or to take any reasonable steps to obtain help. In addition to these, there were 109 patients who failed, presumably through ignorance, to submit themselves to antenatal examination, and these have been included under the appropriate heading.

Cases where No Avoidable Cause has been Detected.

There remain 660 deaths, in some of which there was nothing definite in the report to show that the woman had not received attention in accord with the reasonable standard laid down, while in others the failure to attain the standard had no apparent causal relation to the fatal termination. It should be noted that in a large number of cases failure of the Committee to discover an avoidable cause is probably due to deficient information rather than to the absence of such a cause.

Conclusions.

The committee draw certain conclusions from this section of the report. While emphasising the extreme importance of antenatal examinations, they have found evidence of a certain amount of inefficient work which has passed under the guise of "antenatal care." They consider that adequate and satisfactory antenatal care requires as much experience, as much skill and as much diligence as operative midwifery itself, and that every effort should be made to secure effective medical supervision by competent medical practitioners in close touch with actual obstetric work.

Not only have the Committee found evidence of neglect in antenatal diagnosis, but also to a great extent in antenatal treatment. In many instances failure to treat a patient has largely been due to lack of facilities, and the Committee think that great benefit would follow an increase in the number of beds available for such cases in institutions. In relation to serious complications and accidents of labour, the Committee have ample proof of the need for a higher standard of knowledge and skill on the part of the general practitioner, as well as for the provision of consultant services and of an increase number of readily available hospital beds.

While better facilities for blood transfusion wou be highly advantageous, the majority of cases hæmorrhage and obstetric shock can be saved fro death by the immediate replacement of fluid by intr venous or subcutaneous saline solution or other sui able fluid. Saline solution per rectum may be effecti in mild cases, but the fluid is not absorbed by t bowel in cases of severe collapse. The Committe therefore, regard the extended provision of the services as an essential part of any measures tak for the improvement of midwifery work. They loo for substantial improvement in the number of deat from sepsis following abnormal labour. It seems them a reasonable hope that the amount of difficu midwifery performed under unsuitable conditio will steadily decrease, and as a result the number deaths from sepsis in this group will decrease also.

On the other hand, the number of deaths fro sepsis following "normal labour" demands intensi investigation. Failure in efficient antiseptic techniq probably accounts for a considerable number of the cases.

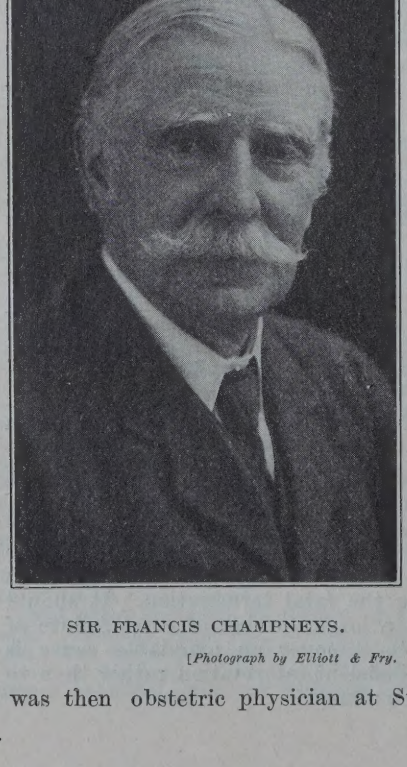
(To be concluded.)

OBITUARY

SIR FRANCIS CHAMPNEYS, Bt., M.D. Oxf., F.R.C.P. Lond.

Sir Francis Champneys, the well-known obstetric physician, died on July 30th at his residence, Littlewood, Nutley, at the age of 82.

Francis Henry Champneys was the second son of the Very Reverend William Champneys, Dean of Lichfield, and was educated at Winchester where he was a scholar, at Brasenose College, Oxford, and at St. Bartholomew's Hospital. At Oxford he obtained a first class in science in 1870, and two years later he was elected Radcliffe Travelling Fellow. Champneys graduated in medicine in 1875, and in the following year obtained the M.R.C.P. Lond. While he held the travelling scholarship he did post-graduate work in Vienna, Leipzig, and Dresden, and in the last city held the post of clinical assistant to the Royal Saxon Lying-in Hospital, thus commencing his successful career as an obstetrician. On returning to London he became assistant to Dr. Matthews Duncan, who was then obstetric physician at St. Bartholomew's Hospital, and was himself made an obstetric tutor the medical college, an appointment which had so influence on his future career. For although in 18 the year he was elected F.R.C.P., Champneys w made obstetric physician at St. George's Hospital, succession to that great and original teacher, Rob Barnes, he was invited to return to St. Bartholomew Hospital on the death of Matthews Duncan, a accepted the invitation. Meanwhile he had be appointed assistant physician to the General Lying Hospital, and found there material which contribut to his wide knowledge of practical obstetrics. As teacher Champneys was fluent and informing in l lectures and clear in his practical demonstratio While he was at St. George's he left the operati side of his department to some extent in the hands the surgical staff, while at St. Bartholomew's t terms of his appointment confined him to midwife His writings are consequently for the most pa concerned with obstetric problems, but when invit by the Harveian Society of London to deliver t Harveian lectures in 1890 he chose for his subje Painful Menstruation. The lectures were afterwa published in THE LANCET, and are noteworthy i the lecturer's discrimination between distress different kinds, ranging from vague discomfort acute localised pain. The general conclusions co cerning dysmenorrhœa in his first lecture show balanced outlook on the psychology of differe types of patient which gives a clue to his success relieving mental as well as physical suffering.



SIR FRANCIS CHAMPNEYS.

[Photograph by Elliott & Fry.

Under the Midwifery Act of 1902 which, af considerable opposition both within and without t medical profession, obtained a place on the Statu book, the Central Midwives Board came in existence, and Champneys was made its first cha man. As is well known, the purpose of the Act w to regulate the practice of women midwives, standardise the education of those who obtained place on the official roll of midwives, and to exerc disciplinary powers such as would prevent t incompetent woman, or woman who failed to obser the regulations of the Act, from maintaining th place on the roll. Champneys held strong vie on the importance of the duties of the Board.

was always sympathetic to the midwives, however, and the fairness and tact with which he managed the proceedings, sometimes difficult and delicate, were acknowledged on all sides, and led to his re-election year by year to the chairman's seat. It is difficult to imagine the Board with any other chairman, for until the illness occurred which ended in his death he was only absent from two Board meetings during the 28 years of his chairmanship. Nor was this his only activity in the administration of professional affairs, for in 1911 he was nominated by the Crown as a member of the General Medical Council; this five years' appointment was twice confirmed, so that Champneys retained his seat on the Council for 15 years. In 1910 he was created a baronet.

Champneys took a keen and active interest in medical societies. He held many official posts in the Obstetrical Society of London, culminating in that of president in the session 1895–96, and communicated much of his work to this society. When it was merged into the Royal Society of Medicine he followed its fortunes with no less interest, and was honoured by being elected president of the last-named society in 1912 and 1913. In 1913 also he acted as president of the Section of Obstetrics and Gynæcology at the International Medical Congress. Naturally his services were sought by examining bodies, and at different times he was an examiner for the universities of Oxford, Cambridge, and London, and for the Conjoint Board. In recent years Sir Francis took a warm interest in the organisation of the British College of Obstetricians and Gynæcologists. He was attracted by the idea when it was first conveyed to him, and gave great help in overcoming the difficulties with which the undertaking was faced. He became a member of the first Council of the College and was elected its first and up to now the only vice-patron.

Apart from his professional activities Champneys was well known in the musical world. Both at school and at college he had been devoted to music, and shortly after his establishment in London he became the centre of a highly musical coterie whose object was the study of church music. He was himself an executant upon several instruments, and the composer of several anthems.

Sir Francis Champneys will be greatly missed in many different circles, and his stimulating personality and wise judgment will long be remembered.

Dr. J. S. Fairbairn writes: "After an association with Sir Francis Champneys of over 25 years, the latter half of them including service together on the Central Midwives Board, I look back on him as an outstanding example of the cultured professional man with a stern sense of public service. He lived up to his high principles and strong convictions, tinged almost with austerity, but without the aggressiveness and love of controversy often associated with them. My acquaintance with him began in his mellower years, when I found an openness of mind and willingness to hear the views of others, and in particular the aspirations of a much younger generation. A concrete instance may best illustrate this aspect of his character. The time was the proposed amalgamation of the medical societies of London into the Royal Society of Medicine, and the occasion an informal discussion thereon following a meeting at his house for another purpose. The union of the Obstetrical with the British Gynæcological Society was mentioned as implicit in this amalgamation, and Champneys once expressed his opposition on the ground that involved great principles underlying the breakaway in the past of the newer from the older society. One of the younger school present pointed out that he and his contemporaries knew nothing of the history of the split and were not prepared to take up the controversies of their predecessors or allow past history to interfere with a movement that seemed otherwise beneficial. Champneys gave us the story and stated his case, but obviously recognised that it had no longer much appeal to those who had not had personal experience of living through the struggle. When the matter came to be discussed later at the Council of the Obstetrical Society and elsewhere, he worked for the amalgamation and became one of the early presidents of the Royal Society of Medicine. Again, in the last three years of his life, when his active professional work was long past, he threw himself wholeheartedly into the scheme for forming a British College of Obstetricians and Gynæcologists and was one of the signatories to its incorporation, because he appreciated the feeling among a younger generation for some body to represent the practitioners and teachers of these subjects. As a final example of his continued interest in work in the hands of a new generation, his response to the request of his friend, the late Sir Clifford Allbutt, to undertake the chairmanship of the examiners in midwifery at the University of Cambridge, may be quoted. He did this for a few years after the war, when well over 70 years of age, and those who acted with him will recollect how he threw himself into the reorganisation of that examination.

His high ideals of public service brought Champneys into touch with many aspects of medical work, but he himself obviously regarded his efforts towards the provision of a body of trained midwives for the country as his chief contribution to the common weal. His interests in this direction began with his appointment to the staff of the General Lying-in Hospital, where the training of women for practice as midwives has always been a prominent feature, and were further developed when he was made chairman of the Midwives Committee of the Obstetrical Society. He constantly referred to the part he had taken in the work of that committee and how he had thereby been brought into conflict with the British Medical Association and General Medical Council. He was thus clearly marked as the chairman of the Central Midwives Board, when constituted by the Midwives Act of 1902, for that body practically took over functions already carried on unofficially by the Midwives Committee of the Obstetrical Society. For 27 years he was annually re-elected by its members as chairman of the Board and, more than any other of its members, was responsible for moulding its procedure and policy. Its early problem was the difficult one of a new and untried body gaining the confidence of the divergent interests represented by the practising midwives it controlled, the general practitioners that came to their aid, the medical officers of health who supervised their practice, and the teachers who had to follow the Board's instructions on training. That the new body succeeded in working smoothly and avoiding serious controversy, even so far as to secure general approval was a remarkable tribute to the sagacity and tact of the man at the wheel. His was no nominal chairmanship, for he was always in touch with the business of the Board and word perfect in his part before each meeting; he was ready to sum up each item on its agenda and had a resolution in draft prepared for discussion. Until he had been over 21 years its chairman he had not missed one of its monthly sessions, and to the last he retained the confidence of its members in his wise counsel.

judicial mind, and practical knowledge of midwifery problems. Nowhere will the death of Sir Francis Champneys be more deeply felt than by the body whose destinies he has guided from the time it came into being."

Sir Francis Champneys was buried at Hampstead Cemetery. A memorial service was held at St. Bartholomew's-the-less on August 2nd. He is succeeded by his only surviving son, Captain Weldon Dalrymple-Champneys, D.M. Oxf., medical officer to the Ministry of Health.

JOHN WALLIS BARRON MASON, M.D. Brux., M.R.C.S. Eng.

Dr. Barron Mason, who died on July 25th, was born in London in 1853, and was educated at Epsom College. From there he went to the Middlesex Hospital, where he won the Broderip scholarship, and qualified in 1875. After holding resident appointments he served as a ship's surgeon for several years, visiting India and the Far East. His father had been in practice at 1, Osnaburgh-terrace, N.W., since Dr. Mason was a small boy, so on returning from the sea he went to live at this address, and after his father's retirement he ran a large general practice there for about 43 years. His health gradually failing, he retired at the end of 1929. He was a well-known and popular figure in the district, and served on the St. Pancras Panel Committee for some years. He leaves a widow, a daughter, and one son, who has succeeded him in the practice, which has now seen three generations of the same family.

JAMES ALLAN GRAY, M.D., F.R.C.P. Edin.

We have to record the death of Dr. J. A. Gray o July 29th. He graduated in arts at Edinburg University in 1872, in medicine in 1876, and receive a gold medal for his M.D. thesis in 1880. His academ career gave the promise of his becoming a consulta physician, and he was elected a Fellow of the Roy College of Physicians of Edinburgh in 1881, but l devoted himself to general practice. He was for period medical officer of health (part time) of t burgh of Leith, then a town of some 75,000 inhab tants. In 1894 the office was made a whole-time on and Dr. Gray retired. He was a man of very distin individuality; quick in perception, ready in arg ment, prompt and adequate in all his profession work. As medical officer of health he had to fa the public health difficulties of the seaport town at time when notification of disease was unknow when infection was still nursed in the general hospita and when sanitation was really in its infancy. Amo other things, he was a master in the gypsy speec and he had come a great deal in contact with t peripatetic gypsies of the North of England. Up last year he was in active practice. He took his f share in the examination boards of the Royal Colleg and was always a welcome companion among h colleagues. His son is Dr. J. D. A. Gray, Liverpool.

Dr. Gray took a keen interest in the Volunteers a retired as surgeon-colonel of the 7th Royal Sco earning the Volunteer Decoration.

MEDICAL NEWS

University of Cambridge.

At recent examinations the following candidates were successful:—

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE (PART II.).

R. J. Dyson, I. A. El-ghamry, M. S. El-Kinani, A. M. Karam, C. O. Karunakaran, J. H. Loots, K. C. K. E. Raja, and W. J. Vickers.

Royal Colleges of Physicians of London and Surgeons of England.

At the Final Examination of the Conjoint Board, held from June 30th to July 22nd, the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas:—

Medicine.—E. F. Adams, Manchester; R. M. Alderton, London; R. Barnes, Manchester; C. R. G. Barrington, Univ. Coll.; J. H. Bartlett, St. Mary's; W. S. Baxter, St. Bart.'s; H. H. W. Bennett, London; G. A. Betts, Birmingham; B. N. Bhandari, Durham; Marjorie E. Birch, Liverpool; Dora E. Brockbank, Royal Free; G. T. W. Cashell, King's Coll.; F. A. Clift, London; L. C. Crane, Manchester; M. J. Cunning, Royal Free; F. M. Day, St. Mary's; S. B. Dimson and G. W. Duncan, Univ. Coll.; J. R. P. Edkins, Manchester; C. F. Evans, Melbourne and London; H. Goldenberg, London; G. J. Griffiths, Westminster; Marjorie K. Hall, Royal Free; H. E. Harding, London; **Honor** E. C. Harvey, Royal Free; W. Hogg, St. Bart.'s; **A.** Jokl, Middlesex; I. J. Keidan, Leeds; G. D. Kersley, St. Bart.'s; S. J. Knight, St. Mary's; E. Lethem, Guy's; B. F. Longbotham, London; P. H. Maal, Amsterdam and Liverpool; D. G. Macdonald, London; F. G. Maitland, St. Mary's; Dorothy Makepeace, King's Coll.; J. T. Mani, Durham; Barbara A. Merlin, Royal Free; W. A. Mirza, Lucknow; H. C. Muirhead, Guy's; Lois M. Munro, Royal Free; Gladys L. Neill, King's Coll.; D. Ockman, Manchester; Doris Onions, Leeds; W. H. Poole, London; J. W. Pugh, Univ. Coll.; J. Rabinovitch, Leeds; Louise Rees and Irene P. Rowlands, Charing Cross; B. Rubinsky, London; S. Ryman, Zürich; R. S. Sandhu, Lahore; W. W. Sargant, St. Mary's; J. Shernovitch, Leeds; Rosalie Shoenberg, Royal Free; D. O. C. Simpson, London; M. Singh, Punjab and Birmingham; Violet Spiller, Royal Free; A. B. Stokes, T. R. Swarup, and G. M. Tickler, King's Coll.; W. J. Tindall, Univ. Coll.; C. Verity and N. S. Walls, Manchester; J. G. Warren and S. I. Weinstein, London; A. M. Weston, Guy's; C. Wright, Univ. Coll.; and C. H. Wrigley, St. Thomas's.

Surgery.—I. S. Acres, London; S. Amir-ud-Din, Edinburgh; R. Barnes, Manchester; D. S. Bateman, St. Thomas's; N. J. Bee, London; J. N. Bhada, Univ. Coll.; B. N. Bhandari, Durham; K. C. Buck, St. Mary's; Joan Butterworth, Royal Free; C. R. Caffry, Dublin and London; Jack Carlton, Guy's; Adelina A. Collins, King's Coll.; G. M. Conder, Middlese J. G. Connell, Cambridge and Sheffield; J. S. Cotman, St. Mar Catherine B. Crane, Royal Free; S. D. Elliott, Univ. Co C. F. Evans, Melbourne and London; S. H. Ferguson, Sheffie J. S. B. Forde, Manchester; H. N. Garrus, Guy's; G. O. Gau Cambridge and Middlesex; J. R. Gilmour, F. R. Glover, an Gold, London; G. H. Gool, Guy's; G. J. Griffiths, Westminst J. H. Hall, St. Thomas's; Marjorie K. Hall, Royal Free; E. Halliwell, Leeds; M. Halperine, London; Carrie I. Hea Royal Free; A. A. Heathcote, St. Bart.'s; J. E. R. Heppole Bengal and St. Mary's; P. A. Hubbard, Univ. Coll.; G. Humphreys and B. Isaac, St. Mary's; L. Jacobson, Lond I. J. Keidan, Leeds; C. J. King-Turner, St. George's; E. Leth Guy's; H. L. Lightstone, Middlesex; H. M. List, St. Bart. J. Loofe, Leeds; A. H. Loudoun, St. Thomas's; W. McGladdery, St. Bart.'s; F. Mattar, Charing Cross; R. Maxwell, Univ. Coll.; E. D. Morgan, Manchester; J. E. Morris, Liverpool; H. S. Morton, London; G. G. Mowat C. E. S. Oxley, St. Thomas's; F. L. L. Patrick, St. Bart. M. A. Robertson, London; H. W. Rodgers, St. Bart.'s; Secker, Durham; J. Shernovitch, Leeds; C. K. Simpson, Guy S. K. Squires, St. Mary's; T. Standring, King's Coll.; M Sutcliffe, Leeds; R. B. Sutcliffe, Guy's; D. J. Swamy, Mad and Durham; O. Thomas, London; W. E. Thomas, Card C. K. Vartan, St. Bart.'s; C. Verity, Manchester; N. A. Vern St. Thomas's; F. L. Wheaton, Middlesex; R. C. W. Whitli Oxford and London; K. L. Wig, Charing Cross; I. G. Willia Middlesex; W. Woolley, Bristol; and C. H. Wrigley, Thomas's.

Midwifery.—J. E. Abell, Leeds; R. M. Alderton and P. Ashby, London; E. S. Asiedu-Ofei, Birmingham; W. Aul Univ. Coll.; Gwendolen E. Austin, King's Coll.; S. Barigras St. Bart.'s; H. B. Barker, St. Mary's; G. Barwell, Guy D. S. Bateman, St. Thomas's; A. J. W. Beard, and F. J. Bell St. Bart.'s; Jessie G. Belilios, King's Coll.; C. M. Bell and W. Bell, St. Bart.'s; C. E. Bevan, St. George's; E. T. Black Guy's; D. A. S. Blair, St. Thomas's; O. J. Bollon, Brist W. V. D. Bolt, Guy's; Doris Boon, Royal Free; O. H. Bosto St. George's; G. D. S. Briggs, St. Bart.'s; R. J. B. Bro Middlesex; J. F. Brock, London; W. D. W. Brooks, St. Mary C. Budeiri, Geneva; T. S. Cave, King's Coll.; C. N. Chit St. George's; S. Cimmering, St. Bart.'s; A. R. Clarke, Guy J. M. P. Clark, Leeds; P. Cohen, St. Bart.'s; G. M. Conc Middlesex; K. M. Cooper, Royal Free; T. R. S. Corma London; J. L. S. Coulter, Bristol; Marian J. Cunning, Ro Free; R. D. Darley, Univ. Coll.; J. O. F. Davies, Middlese R. R. Davies, Univ. Coll.; T. F. Davies, Guy's; C. A. de Cand St. George's; W. De Lacey and N. M. Durrani, London; J. R. Edkins, Manchester; S. D. Elliott, Univ. Coll.; G. Emmerson, St. Mary's; J. M. Erskine-Young, Liverpo J. Finer, Middlesex; H. W. F. Freeth, Middlesex; J. W. Freeth, St. Bart.'s; R. J. Furlong, St. Thomas's; L. T. Furniv St. Mary's; G. O. Gauld, Middlesex; W. T. F. George,

Bart.'s; D. G. Gower, Westminster; A. Greenberg, St. Bart.'s; H. J. Griffiths, Middlesex; Constance A. Grove, Charing Cross; A. J. Hackett, St. Bart.'s; E. O. Halliwell, Leeds; K. Harris, Guy's; A. C. Hauptfleisch, Guy's; K. Hazell, King's Coll.; C. B. Hinkley, St. Thomas's; G. Holroyd, Guy's; H. W. Howell and L. Jacobson, London; D. W. James, Guy's; A. Jokl, Middlesex; L. R. Jordan, Bristol; F. Jupe, Berlin; A. Kahan, St. Thomas's; Henrica A. Kellgren, Univ. Coll.; T. A. S. Kennerley, Birmingham; J. A. Kersley, Bristol; M. H. Khan, Durham; A. A. Kidvai, Dundee and King's Coll.; M. M. Landau, Middlesex; R. C. Langford, St. Thomas's; A. J. D. Lewis, Guy's; Teresa Lightbound, Liverpool; G. A. M. Lintott, Guy's; A. W. Littlewood, St. Mary's; M. A. Lloyd, St. Bart.'s; Muriel H. E. Long, King's Coll.; G. W. May, London; J. O. McCarter, Manchester; D. P. McCoy, St. Bart.'s; T. W. Mimpriss, St. Thomas's; E. L. Monkhouse, Guy's; R. H. Moore, Bristol; I. More, Univ. Coll.; E. D. Morgan, Manchester; C. H. Morrell, St. Bart.'s; Elisabeth J. Morris, Liverpool; H. S. Morton, London; G. G. Mowat, St. Thomas's; C. G. Muller, Madras and St. Mary's; P. M. Nair, Royal Free; B. Nanjiani, Bombay; G. H. Newns and W. M. Niblock, King's Coll.; D. Ockman, Manchester; M. J. O'Donnell and J. W. Oliver, Guy's; H. J. C. Page, St. Mary's; R. Palmer, King's Coll.; D. W. Parkes, Birmingham; J. H. Peel, King's Coll.; M. W. Priest, Univ. Coll.; S. Rajapaksa, King's Coll.; J. Reeve, Westminster; W. F. Richards, J. C. Roberts, and H. D. Robertson, St. Bart.'s; J. N. N. Robinson, St. Thomas's; M. W. Robinson, Manchester; A. W. M. Rooke, Univ. Coll.; L. Rose, St. George's; J. Rosenberg, Guy's; P. M. G. Russell, Univ. Coll.; W. W. Sargant, St. Mary's; Mary A. Saunders, King's Coll.; Ida B. Saxby, Bristol; Ray Schauder, King's Coll.; G. Scott, Middlesex; J. Secker, Durham; R. H. D. Short, Univ. Coll.; A Shufleder, Leeds; A. B. Simmons, King's Coll.; H. Simpson, Manchester; K. H. Singh, King's Coll.; R. N. C. Smith, Guy's; L. R. C. South, London; K. S. Southam, Guy's; H. W. G. Staunton, St. Bart.'s; A. M. Stewart-Wallace, Univ. Coll.; J. W. Summerhayes and T. R. Swarup, King's Coll.; A. Taylor, Manchester; W. A. F. Taylor, Bristol; O. Thomas, London; G. M. Tickler, King's Coll.; R. L. H. Townsend, London; J. G. Vincent-Smith, St. George's; N. S. Walls, Manchester; Phyllis E. Watson, Charing Cross; J. H. West, St. Bart.'s; Evelyn A. M. White, Univ. Coll.; J. L. Wild, St. Thomas's; R. G. Wilbond, Bristol; I. G. Williams, Middlesex; Anne E. Williams-James, Bristol; C. Wilson, London; E. M. Wingfield, Birmingham; F. J. Wright, London; and St. B. D. Wright, St. Mary's.

Pathology.—Gwendolen E. Austin, King's Coll.; S. Barigrasser, St. Bart.'s; H. B. Barker, St. Mary's; H. W. Benham, Univ. Coll.; H. Bloom, Guy's; R. J. B. Broad, Middlesex; Dora E. Brockbank and Beatrice L. Campion, Royal Free; P. H. Charlton, Middlesex; P. Cohen, St. Bart.'s; H. E. B. Curjel, St. Thomas's; A. Cursham, Cambridge and St. Thomas's; D. R. Davies and S. B. Dimson, Univ. Coll.; G. R. Ellis, Liverpool; E. St. J. C. Emerson, St. Mary's; G. A. Emmerson, St. Mary's; D. Erskine, Guy's; A. G. Evans, Birmingham; H. W. F. Freeth, Middlesex; J. W. O. Freeth, St. Bart.'s; E. T. Furnivall, St. Mary's; H. N. Garrus, Guy's; W. F. T. George, St. Bart.'s; V. Glass, Univ. Coll.; B. N. Halder, Durham; Marjorie K. Hall and Honor E. C. Harvey, Royal Free; E. C. Hauptfleisch, Guy's; K. Hazell, King's Coll.; H. W. Howell, London; Blaguigna Illitch, Royal Free; E. Jones, St. Thomas's; M. Kosloff, B. S. Lange, and G. F. Lashmore, Guy's; H. L. Lightstone, Middlesex; Muriel H. E. Long, King's Coll.; D. P. McCoy, St. Bart.'s; R. A. Manclark, Middlesex; E. Matthew, King's Coll.; J. N. Matthews, Liverpool; E. L. Monkhouse, Guy's; I. More, Univ. Coll.; W. H. Mylechreest, St. Thomas's; G. H. Newns and W. M. Niblock, King's Coll.; H. J. C. Page, St. Mary's; R. O. Payne, Guy's; C. F. Price, W. M. Priest, and Anna L. M. Ringdahl, Univ. Coll.; H. W. Rodgers, St. Bart.'s; P. M. G. Russell, Univ. Coll.; D. N. Ryalls, Sheffield; M. Schlaff, St. Bart.'s; Ester C. Seifert, Westminster; E. Sherman, St. Bart.'s; R. H. D. Short, Univ. Coll.; A. B. Simmons, King's Coll.; E. H. P. Smith, Birmingham; J. W. P. Thompson, St. Thomas's; W. J. Tindall, Univ. Coll.; N. A. Vernon, St. Thomas's; J. H. Way, Leeds; F. L. Wheaton, Middlesex; S. O. Widmann and J. L. Wild, St. Thomas's; and A. H. Zair, Birmingham.

Royal College of Physicians of London.

At the Quarterly Comitia of the College, held on July 31st, with Sir John Rose Bradford, the President, in the chair, the following Fellows of the College were elected officers for the ensuing year:—

Censors: Dr. F. J. Poynton, Dr. W. Langdon Brown, Dr. S. R. Box, and Sir Charlton Briscoe, *Treasurer:* Dr. S. P. Phillips. *Registrar:* Dr. Raymond Crawfurd. *Harveian Librarian:* Dr. T. H. Arnold Chaplin. *Assistant Registrar:* Dr. R. O. Moon. *Library Committee:* Dr. H. R. Spencer, Dr. H. C. Cameron, Dr. C. J. Singer, and Dr. Anthony Feiling. *Curators of the Museum:* Dr. H. R. Spencer, Dr. J. H. Thursfield, Dr. S. E. Dore, and Dr. C. F. T. East. *Finance Committee:* Dr. H. Morley Fletcher, Dr. Robert Hutchison, and Dr. L. S. T. Burrell.

The following were elected Examiners:—

Chemistry: Mr. H. W. Cremer, Mr. W. B. Tuck, D.Sc., *Physics:* Dr. W. A. M. Smart, and Mr. D. Orson Wood. *Practical Pharmacy:* Prof. J. A. Gunn, Prof. W. E. Dixon, Dr. Philip Hamill, Dr. Newman Neild, and Dr. Orlando Inchley. *Physiology:* Prof. Joseph Barcroft and Prof. R. J. S. McDowall. *Anatomy:* Prof. Duncan Blair. *Pathology:* Dr. C. E. Lakin, Dr. George Graham, Prof. Matthew J. Stewart, and Dr. H. W. C. Vines. *Medical Anatomy and Principles and Practice of Medicine:* Sir Thomas Horder, Dr. A. E. Russell, Dr. Cecil Wall, Dr. E. A. Cockayne, Dr. E. P. Poulton, Dr. D. H. de Souza, Dr. Albert Ramsbottom, Dr. A. C. D. Firth, Dr. F. M. R. Walshe, Dr. A. Bellingham Smith, Dr. L. S. T. Burrell, and Ivor J. Davies. *Midwifery and Diseases Peculiar to Women:* Dr. Eardley Holland, Mr. J. B. Banister, Mr. J. P. Hedley, Mr. D. W. Roy, and Mr. A. C. Palmer. *Public Health:* (Part I.) Dr. G. Roche Lynch. (Part II.) Dr. G. F. Buchan. *Tropical Medicine:* Dr. J. C. G. Ledingham and Dr. H. Harold Scott. *Ophthalmic Medicine and Surgery:* Dr. T. Grainger Stewart. *Psychological Medicine:* (Part I.) Dr. Edward Mapother. (Part II.) Dr. Porter Phillips and Dr. Gordon Holmes. *Gynæcology and Obstetrics:* Prof. Munro Kerr. *Laryngology and Otology:* Mr. Gay French.

The following acceptances of appointments were announced: Dr. Macdonald Critchley as Goulstonian lecturer for 1931; Sir William Willcox as Lumleian lecturer for 1931; Sir Andrew Balfour as FitzPatrick lecturer for 1931; Dr. Samson Wright as Oliver-Sharpey lecturer for 1931; and Dr. J. W. McNee as Croonian lecturer for 1932.

The President announced that he had appointed Dr. Robert Hutchison to deliver the Harveian Oration, and Dr. J. S. Fairbairn the Bradshaw Lecture in 1931.

The Moxon Gold Medal, awarded every third year to the person who is deemed to have most distinguished himself by observation and research in clinical medicine, was awarded to Dr. Frederick Parkes Weber.

The Weber Parkes Prize and Medal, awarded every third year for work on the ætiology, prevention, pathology, or treatment of tuberculosis, were awarded to Prof. S. Lyle Cummins.

Sir John Rose Bradford was appointed a representative of the College on a committee appointed by the Board of Control to advise on certain matters under the new Mental Treatment Act.

Sir George Newman and Dr. J. W. McNee were elected representatives of the College on the executive committee of the Imperial Cancer Research Fund.

The Murchison Scholarship was awarded, after a competitive examination in clinical medicine, to John St. Clair Elkington, M.B., and Kenneth Moorhouse Robertson, M.B., jointly.

Dr. A. F. Voelcker was appointed to represent the College at the celebration in October of the jubilee of the foundation of Mason Science College, Birmingham, and the thirtieth anniversary of the granting of the University charter.

The following candidates, having satisfied the Censor's Board, were admitted Members:—

Philip J. Alpers, Benjamin Barling, Innes A. Brodziak, James W. Brown, Eleanor M. Creak, Philip E. J. Cutting, John Dockray, Mohammed Abdul Aziz El Gammal, John C. Hawksley, Roy H. Howells, Charu Chandra Kapila, Gwash Lal, Edward W. Lindeck, Frederick M. Lipscomb, Florence Louis, Thomas K. S. Lyle, Harry E. Mansell, Dhirendra Chandra Mazumdar, Andrew J. Morland, Santosh Kumar Mukhopadhyay, Margaret G. P. Reed, Edward G. Robertson, Gerald R. A. de M. Rudolf, Ismail Ahmed Sabri, James D. Simpson, Eliot T. O. Slater, John Smith, Bashi Lal Taneja, and John R. H. Towers.

At the same meeting of the Comitia on July 31st licences to practise were conferred upon 141 candidates (115 men and 26 women) who have passed the final examinations of the Conjoint Examining Board. The following are the names and medical schools of the successful candidates:—

Constance E. Allan, Royal Free and Charing Cross; S. G. Allen, L.D.S., London; R. E. Angel, St. Bart.'s; Lily Arratoon, Indiana and Royal Free; J. Aytoun, Middlesex; F. G. Badger, Cardiff and London; W. I. Bain, Cambridge and St. Thomas's; W. L. H. L. Bell, St. George's; S. W. T. Bentall, Oxford and London; A. C. Bhardwaj, Punjab and Guy's; I. Billig, St. Thomas's; W. R. Bion, Oxford and Univ. Coll.; A. N. Birkett, Manchester; S. Bochenek, St. Bart.'s; Kathleen M. Bodkin, Birmingham; B. F. M. Bond, Westminster; F. K. Boston, Cambridge and St. Bart.'s; Julia A. Boyd, Royal Free; L. V. O. Brown, Cambridge and Guy's; A. Buch, St. Mary's; W. R. Burrows, St. Bart.'s; M. L. Bynoe, King's Coll.; E. C. Campbell, Cambridge and St. Mary's; G. F. Carey, Cambridge and St. Thomas's; J. Chamberlain, Guy's; H. M. Chappel, Cambridge and Univ. Coll.; L. Charney, Cape and London; W. F. Church, Cambridge and St. Bart.'s; L. P. Clarke, L.M.S.S.A., St. George's; A. H. Clegg, Leeds; D. H. Collins, M.B., Liverpool; R. V. S. Cooper, M.B. Birmingham; W. C. Cresdee, St. George's; R. M. S. Cross, Cambridge and St. Bart.'s; Elizabeth T. Davies, Westminster; L. S. Davies, Cardiff and Guy's; C. G. S. De Silva, Ceylon and Guy's; C. H. Devin, St. Bart.'s; D. Divine, Cambridge and Guy's; R. H. Dodds, Cambridge and London; J. A. Doherty, Univ. Coll. and Durham; N. R. Donald, Liverpool; Mary G. H. Edwards, St. Mary's; A. Elliott, M.B. Birmingham; M. M. El Mishad, Cairo and Guy's; A. A. G. Flemming, Cambridge and Bristol; G. M. Flemming, St. Bart.'s; E. V. P. Fox, Cambridge and St. Bart.'s; Margaret L. Foxwell, Manchester; P. I. Franks, St. Bart.'s; L. P. Friedman, Univ. Coll.; Lorna M. A. Goulden Bach, Westminster; Mabel E. Grace, Royal Free; C. A. Grant, Cambridge and St. George's; E. R. Greathead, Cambridge and London; G. Hale, Cambridge and St. Thomas's; J. T. P. Handy, Univ. Coll.; R. D. Harding, Oxford and King's Coll.; Eileen E. Harvey, Royal Free; R. M. Harvey, London; Gladys M. Herbert, St. Mary's; Constance M. Hoare, King's Coll.; H. L. Hodgkinson, St. Bart.'s; Laura M. Hollingworth, Univ. Coll.; J. C. de V. Hutchinson, Cape and Guy's; E. B. Jackson, Univ. Coll.; E. J. Javeri, M.B., Bombay and London; G. H. Jennings, Cambridge and St. Mary's; H. B. John, St. Mary's; I. G. Jones, Univ. Coll.; W. D. G. Jones, Guy's; C. R. Kenchington, M.B., Birmingham; P. A. E. Lansle, M.D., Lausanne and London; S. R. Ledger, King's Coll.; J. C. Leedham-Green, Oxford and Middlesex; Edna Lock, King's Coll.; R. F. Lomax, Oxford and Guy's; R. P. Lucas, M.B.,

Bristol; H. O. Lyne, L.D.S., Guy's; Joyce MacInnes, Royal Free; Moyra I. Macnaughton-Jones, Royal Free; F. G. Mailtand, Cambridge and St. Thomas's; H. S. A. Malik, M.B., Bombay and St. Thomas's; P. T. Merlin, M.B., Birmingham; Elizabeth T. Mess and Ruth Milne, Royal Free; Blodwen Morgan and G. D. Morgan, Charing Cross; K. I. Nicholls, Bristol; T. C. Outred, Guy's; G. A. Y. Parker, St. Bart.'s; C. F. L. Patterson, Cambridge and St. George's; G. H. Pearce, Univ. Coll.; R. B. Peckham and N. S. Plummer, Guy's; N. H. L. Ridley, Cambridge and St. Thomas's; R. S. Risk, St. Bart.'s; D. M. Roberts. Cardiff and London; J. M. Robertson and L. K. Robson, Guy's; Helen E. Rodway, Royal Free; A. L. Rowson, Manchester and London; M. H. Salaman, Cambridge and London; F. M. Sandford, St. Thomas's; K. C. Sarkar, M.B., Calcutta and King's Coll.; J. M. Searle, London; T. S. Severs, M.B., Durham; Violet R. Sharp and Dorothy A. Sharpe, Royal Free; C. J. C. Siggers, L.D.S., Guy's; W. W. Simkins, St. St. Mary's; C. H. Sims, Westminster; K. C. S. Skene, Univ. Coll.; M. W. Smith, Manchester; J. Sowerbutts, Cambridge and St. Thomas's; A. A. Staunton, St. Bart.'s; D. J. R. Steen, Cambridge and St. Thomas's; G. V. Steward, Guy's; J. G. Stewart, Westminster; H. M. Strover, M.B., Bristol; H. B. Swift, M.B., Punjab and St. Mary's; K. T. Taskar, M.B., Bombay and London; C. E. Taylor, Cambridge and King's Coll.; M. R. Thomas, Univ. Coll.; K. S. Thompson, London; C. J. L. Thurgar, Univ. Coll.; T. F. Tierney, St. Bart.'s; O. T. Wade, Leeds; W. N. P. Wakeley, King's Coll.; E. C. Watson, St. Mary's; J. C. S. Wells, Univ. Coll.; Margaret E. Williams, Bristol; T. C. Williams, Wales and Univ. Coll.; T. G. Williams, Middlesex; B. Willinsky, M.D., Toronto; Maureen D. Willmott Evans, Royal Free; F. W. Willway, King's Coll.; W. E. Wimberger, M.B., Birmingham; H. A. M. Wintle, St. Thomas's; Barbara E. Woodhead, M.B., Birmingham; and F. C. A. Wright, King's Coll.

The undermentioned diplomas were conferred (jointly with the Royal College of Surgeons) upon the following candidates:—

Diploma in Psychological Medicine.—R. D. Curran, J. W. Fisher, J. Flind, R. N. B. McCord, W. M. McGrath, W. Ogden, D. N. Parfitt, R. Ström-Olsen, V. Vassallo, and A. W. Watt.

Diploma in Laryngology and Otology.—C. A. Amesur, A. B. Berkowitz, E. G. Dermer, A. M. El Hakim, A. El S. Handousa, B. Hiller, I. Kallmeyer, F. T. Land, M. R. Levey, H. Lewis, G. R. Marcano, F. G. Meade, F. Phillips, S. N. Prasad, H. W. Savige, G. S. Seed, and S. K. Sen Gupta.

Diploma in Public Health.—Edith L. I. Abbott, Iris I. G. Adams, H. W. Allen, J. V. Almeyda, G. R. M. Apsey, S. K. Arora, E. R. Boland, M. S. Chadha, S. Dakshinamurty, Edith M. Davies, I. G. Davies, P. T. J. Doss, S. W. Eveson, A. H. Gale, K. K. Goh, Phyllis M. Grainger, A. Hamid, E. B. Jones, B. N. Khanna, N. K. Kumaran, B. K. Lal, B. D. Malhotra, B. D. Mallick, R. Mansoor, H. D. M. L. Murray, W. R. Nash, G. E. B. Payne, S. M. Rahman, G. A. Roche, A. Shafi, J. Spencer, M. P. Srivastava, and V. Whitman.

Diploma in Tropical Medicine and Hygiene.—C. A. Alvarado, T. F. Anderson, W. K. Connell, A. B. Cook, M. K. Kelavkar, E. M. Lourie, D. R. McPherson, F. Marsh, T. H. Nolan, P. K. Rao, C. E. Roberts, R. Shelley, M. Singh, R. G. Spink, T. W. Stephens, Dorothy E. Stewart, Marjorie V. N. Sudds, B. A. Taylor, S. E. Theis, H. G. Timbres, Gladys M. Tullidge, and E. M. Wijerama.

Diploma in Ophthalmic Medicine and Surgery.—Dorothy R. Adams, T. S. Blackiidge, H. P. Chaudhuri, M. A. Contractor, E. R. Cunningham, J. Dadabhoy, D. R. Gawler, L. M. Green, Millicent Hamilton-Johnstone, H. V. Ingram, S. Lal, Laura M. Ligertwood, S. S. Lindsay, L. Mahadevan, T. M. Mansfield, A. B. Rao, C. N. Smith, L. Staz, L. Tarneja, H. Tomkin, T. a'B. Travers, and D. K. Weston.

Royal College of Surgeons of England.

AN Ordinary Meeting of the Council was held on July 31st, with Lord Moynihan, the President, in the chair.

The Honorary Gold Medal of the College was awarded to Mr. R. Lawford Knaggs, F.R.C.S., in appreciation of his services to the Museum, more especially in preparing a catalogue of and revising the Strangeways Collection of specimens illustrating arthritis.—The first Macloghlin Scholarship for medical students was awarded to L. J. Honeywill of Bournemouth School.—Mr. Frank Coleman, dental surgeon to St. Bartholomew's and theRoyal Dental Hospital, was elected a Member of the Board of Examiners in Dental Surgery.—Mr. C. H. Fagge and Dr. R. G. Canti were elected Examiners in Pathology under the Examining Board in England.—Prof. William Wright and Prof. C. Lovatt Evans were nominated to conduct the Primary Examination for the Fellowship in Australia in 1931.

Diplomas of Membership were granted to the following candidates, whose names appear above as recipients of the L.R.C.P. Lond., with the exception of J. A. Boyd, M. A. Grace, R. D. Harding, L. M. Hollingworth, J. MacInnes, R. Milne, H. E. Rodway, and V. R. Sharp. Other diplomas were granted jointly with the Royal College of Physicians to the candidates whose names are given above.

Society of Apothecaries of London.

At recent examinations the following candidates were successful:—

Surgery.—M. M. Barritt, Manchester; G. T. W. Cashell, King's Coll. Hosp.; J. S. P. Coutts and G. R. Davies, St. Mary's Hosp.; H. Glynn, Charing Cross Hosp.; C. R. Graham, Kingston, Ontario; F. Mattar, Charing Cross Hosp.; G. W. Sturgess, St. Bart.'s Hosp.; W. H. Willis, Western Reserve Univ., U.S.A.; and G. K. Wilsker, Liege and Royal Free Hosp.

Medicine.—M. Asaad, St. Mary's Hosp.; M. M. Barritt, Manchester; A. Buch, E. C. Dymond, and J. E. R. Heppolette, St. Mary's Hosp.; S. R. G. Pimm, Guy's Hosp.; Z. Risk, Birmingham; A. L. Thomas, Guy's Hosp.; and G. H. C. Walmsley, Manchester.

Forensic Medicine.—E. C. Dymond, St. Mary's Hosp.; R. F. T. Finn and J. D. B. Games, St. Bart.'s Hosp.; C. Seeley, St. Mary's Hosp.; and I. J. Todd-Naylor, King's Coll. Hosp.

Midwifery.—M. M. Barritt, Manchester; R. F. T. Finn, St. Bart.'s Hosp.; G. W. Hinchliffe, St. Mary's Hosp.; E. J. Jones, Cardiff; C. G. Muller, St. Mary's Hosp.; R. D. Newton, St. Bart.'s Hosp.; and G. H. C. Walmsley, Manchester.

The Diploma of the Society was granted to th following candidates, entitling them to practise medicine, surgery, and midwifery: A. Buch, G. T. W. Cashell, E. C. Dymond, J. D. B Games, J. E. R. Heppolette. S. R. G. Pimm, Z. Risk, A. L. Thomas, G. K. Wilsker, and W. H. Willis.

University of London.

Dr. J. M. W. Morison has been appointed to the Univer sity Chair of Radiology tenable at the Cancer Hospita (Free). He is at present lecturer in radiology at the Univer sity of Edinburgh.

A. R. F. Thompson, Guy's Hospital, has passed the fourth (B.D.S.) examination in dental surgery.

At a meeting of the University Court on July 30th it was stated that, subject to Parliamentary sanction, the annual Treasury grant in respect of the University and its schools will be £556,000 for the academic year 1930–31 The amount of the grant for 1929–30 was £496,050. Fo 1930–31 the interim maintenance grant from the Londo County Council will be £105,000, which represents a increase of £24,000 on the existing grant. The Londo County Council has decided, subject to certain conditions to make a total capital grant of £250,000 towards th erection and equipment of buildings on the Bloomsbur site and a capital grant for the quinquennium 1930–35 o £150,000 towards the capital requirements of schools no connected with the Bloomsbury site.

Royal College of Physicians of Edinburgh, Roya College of Surgeons of Edinburgh, and Faculty of Physicians and Surgeons of Glasgow.

The following candidates for the triple qualification hav been approved and have been admitted as licentiates:—

H. H. Jones, Esther A. Michael, John McConnell, J. F la Frenais, A. D. Wilson, Cyril Bellamy, J. B. Harris, A. F Hunt, C. B. Watson, J. P. Walsh, R. L. Allan, H. C. Bodeme J. L. W. Davies, Effie E. Keighley, William Stevenson, M. F Moss, Mah Kee Yong, W. E. M. Blamey, William Graham Chua Chow Teck, Premarathna Kulasinghe, Chandra Das Amarasinha, I. D. Grant, E. T. Buck, J. A. S. de Sampayo R. P. Carew-Smyth, R. S. Wilson, and Bhagwan Wadhuma Advani.

The following have satisfied the examiners in the under mentioned subjects:—

Medicine.—Amin Fazary, Kastooril Cranganore Shankar Menon, Kwong Lam Loh, Adian Joseph Abeyesundere, Richar Morton, Maharaj Narain Rozdon, J. B. D. Oliver, J. C. Bloi J. L. K. Lawson, Parshotam Dass, and Fouad Nafi.

Surgery.—Amin Fazary, Kwong Lam Loh, Yatramull Mohandirange Edwin Abeyesundere, W. E. S. Winne, an Joseph Rosenberg.

Midwifery.—Kwong Lam Loh, Adian Joseph Abeyesunder Richard Morton, Maharaj Narain Rozdon, Yatramul Mohandirange Edwin Abeyesundere, Joseph Rosenberg Mahabalaga Don Daniel Jayawardana, Parshotam Dass, an Gavin Brown.

Medical Jurisprudence and Public Health.—F. R. Le Rou Euphemia Cardwell, Ying Hong Kwan, R. D. Johnston, Barn Meyerowitz, A. M. Clement, Frederick Ludorf, Stewart McCallun Helen H. Norris, Wai Ming Tso, F. A. Ebert, I. M. Sclar Donald Cameron, J. P. Collee, L. J. Goggins, Max Natha Julius Osipowitz, and H. F. Ezzet.

Research on Rheumatoid Arthritis.

The University of Manchester invites application for Fellowship for investigation into the causes and treatmer of rheumatoid arthritis. Particulars will be found in ou advertisement columns.

Course in Mental Deficiency.

For the benefit of those engaged in the training of ment defectives a course will be held in London from August 30t to Sept. 20th by the Central Association for Mental Welfar 24, Buckingham Palace-road, S.W. 1.

International Congress of Radiology.

The Third International Congress of Radiology will b held in Paris from July 27th to 31st, 1931. The presidei is Dr. Antoine Bèclere, the secretary-general Dr. J. Ledoux-Lebard, and the address of the Congress, 12 rue la Boëtie, Paris VIII^e.

London Hospital Sunday Fund.

The total amount received by the Fund this year w £73,012, which is about £5000 less than in 1929. Th number of institutions which have applied for help is 23 an increase of five, and the Council have decided to distribu £73,000.

reatment of Early Mental Patients.

The mansion of Wellwood, Pitfodels, is being acquired by berdeen Infirmary as a private nursing home for the treatent of early cases of nervous and mental disease. The me will receive patients as voluntary cases without legal rmalities. The cost of purchase and adaptation will be out £12,000, and the house will accommodate 20 patients d the nursing staff.

n International Hospital Ward.

At a luncheon given last week by the Governors of the iddlesex Hospital to foreign and American press representives Prince Arthur of Connaught, the Chairman, suggested e desirability of creating an international ward. r. Comyns Berkeley, obstetric and gynæcological surgeon the hospital, stated that on an average one scientist medical man from abroad visits the hospital each week, at an average of 45 students attend the post-graduate ass, and nurses from Germany, Holland, and Sweden e trained. Two out of every seven patients are of foreign rth.

ospital Extensions.

The Duke of Portland last week laid the foundation-stone a new block of Worksop Victoria Hospital which will ntain 40 beds and training quarters for nurses. The o new wards will be used for male surgical cases and the st will be £12,000. There is already a long waiting list.— ast week Lord Howard of Penrith opened two new wards d a Pathological Department at the Cumberland Infirmary, rlisle. The Balfour Paul Ward is named after the late norary surgeon. The infirmary now contains 150 beds.— e out-patients' department and the accommodation for rses at the Devon and Exeter Hospital are to be enlarged a cost of £20,000.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

LLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 11th, to SATURDAY, August 16th.—ALL SAINTS' HOSPITAL, Vauxhall Bridge-road, S.W., Afternoon and Evening Course of Clinical and Cystoscopic Demonstrations (Male and Female).—BROMPTON HOSPITAL, All Day Course. Further particulars from the Fellowship of Medicine.

Appointments

ATSON, R., B.Chir. Camb., L.R.C.P. Lond., M.R.C.S., has been appointed Assistant Medical Officer of Health and Assistant School Medical Officer to the Doncaster Corporation.

Vacancies

For further information refer to the advertisement columns.

trincham General Hospital, Cheshire.—Jun. H.S. At rate of £120.
hton-under-Lyne, District Infirmary.—H.S. At rate of £150.
rnsley, Beckett Hospital and Dispensary.—Res. Surg. O. £300.
th, Royal United Hospital.—Asst. H.S. At rate of £120.
dford County Hospital.—Asst. H.S. £130.
thnal Green Hospital, Cambridge-road, E.—Jun. Asst. M.O. £350.
rmingham, City Hospital, Little Bromwich.—3rd and Jun. Asst. M.O.'s. £350 and £300 respectively.
rmingham, Highbury Hospital, Moseley.—Res. Asst. M.O. £300.
rmingham, Midland Hospital, Easy Row.—H.S. £200.
rmingham, Queen's Hospital, Medical School.—Med. Reg. £200.
ackburn, Royal Infirmary.—3rd and 4th H.S.'s. £175 and £150 respectively.
adford City, Municipal General Hospital, St. Luke's.—H.P.'s and H.S's. Each at rate of £200.
adford, Royal Eye and Ear Hospital.—Jun. H.S. £150.
ighton, Royal Sussex County Hospital.—Cas. H.S. £120.
rlisle, Cumberland Infirmary.—2nd H.S. Also H.S. to Special Depts. Each at rate of £155.
ester Royal Infirmary.—H.P. £150.
y of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
lchester, Royal Eastern Counties' Institution for the Mentally Defective.—Research Worker. £750.
nnaught Hospital, Orford Rd., Walthamstow, E.—Sen Res. H.S. At rate of £150.
ydon County Borough, Public Assistance Dept.—Res. Asst. M.O. for Mayday-road Hospital. £300.
ydon County Borough, P.H. Dept.—Asst. M.O.H. for Obstetrics. £600.
Derbyshire Royal Infirmary, Derby.—Ophth. H.S. £150.
Dewsbury, New Dewsbury and District General Infirmary.—Jun. H.S. £150.
Doncaster Royal Infirmary.—Three H.S.'s and one H.P. All at rate of £200.
Durham County Council.—District Tuber. M.O. £500.
Gloucester County and City Mental Hospitals.—Jun. Asst. M.O. £350.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. At rate of £150.
Hammersmith Hospital, Ducane-road, Shepherd's Bush, W.—3rd Asst. M.O. £275.
Hertford County Hospital.—H.P. At rate of £150.
Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O. £200.
Ilford, King George Hospital.—Res. M.O. £200.
Infants Hospital, Vincent-square, Westminster, S.W.—Two H.P.'s. Each at rate of £75.
King's College Hospital, Denmark-hill, S.E.—Jun. Physician.
Leeds, Herzl Moser Hospital, Leopold-street.—R.M.O. £100.
Liverpool City.—Res. Asst. M.O.'s. £200.
London University, South Kensington, S.W.—William Julius Mickle Fellowship. £200.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester University.—Demonstrator in Chemical Pathology. £350.
Margate and District New General Hospital.—Res. M.O. £125.
Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. £250.
Merthyr General Hospital.—Res. H.S. At rate of £150.
Middlesex Hospital, W.—Medical Men interested in Radium Treatment of Malignant Disease.
Nottingham, Hospital for Women.—H.S. At rate of £150.
Nottingham and Midland Eye Infirmary.—Res. H.S. £200.
Oldham Royal Infirmary.—Two H.S.'s to Special Departments. Each at rate of £175.
Plymouth, South Devon and East Cornwall Hospital.—Hon. P. and Hon. Asst. P.
Preston County Borough.—Asst. School M.O. £600.
Richmond, Surrey, Royal Hospital.—Jun. H.S. At rate of £100.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Ryde, Royal Isle of Wight County Hospital.—Two Hon. Anæsthetists.
Southampton County Borough.—Asst. School Dentist. £450.
St. Charles Hospital, Charles-square, Ladbroke-grove, W.—3rd Asst. M.O. £300.
St. Giles' Hospital, Brunswick-square. S.E.—Deputy Med. Supt. £650.
Stockport Education Committee.—Asst. School Doctor. £500.
Saint Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—Res. Surg. O. At rate of £150.
Salford, Hope Hospital.—Res. Surg. O. £400.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Swansea County Borough, Infectious Diseases Hospital.—Res. M.O. £350.
Walsall Manor Hospital.—Res. Asst. M.O.'s. £200 and £150 respectively.
Warwick County Mental Hospital, Hatton.—Jun. Asst. M.O. £350.
West Ham County Borough.—Deputy M.O.H. £850.
Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. Also H.S. £200 and £150 respectively.
Wolverhampton Royal Hospital.—Res. Asst. S. and Surg. Reg. £300. Also Cas. O. and Res. Anæsthetist. At rate of £125.
The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Saxmundham (Suffolk), and at Totton (Hampshire).

Births, Marriages, and Deaths

BIRTHS.

BEARE.—On July 31st, at Deepdene Park-road, Dorking, the wife of C. E. Beare, M.B., F.R.C.S., of a daughter.
RICHARDS.—On July 28th, at Westbury, Wilts, the wife of Dr. W. K. A. Richards, of a son.
WILLIAMSON.—On July 29th, at Ziarat, Baluchistan, India, the wife of Major Williamson, O.B.E., I.M.S., of a son.

DEATHS.

CHAMPNEYS.—On July 30th, at Littlemead, Nutley, Sussex, Sir Francis Henry Champneys, Bt., M.D., F.R.C.P., aged 82.
HOWORTH.—On July 28th, Wilfred Howorth, M.R.C.S., L.R.C.P., Brevet Colonel, R.A.M.C.(T.), of Brunswick-road, Withington, Manchester, aged 63.
WALKER.—On July 27th, at a nursing home, suddenly, Capt. J. T. Ainslie Walker, R.A.M.C.(T.F.), F.R.S.M., F.I.C., F.C.S., &c.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I., 1930.

THE Index and Title-page to Vol. I., 1930, which was completed with the issue of June 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NOTES, COMMENTS, AND ABSTRACTS

THE AUSTRALIAN CANCER ORGANISATION.

By Arthur Burrows, M.D., M.R.C.P., D.M.R.E.,
RADIUM AND CANCER ADVISOR TO THE COMMONWEALTH GOVERNMENT.

THE movement which led to the establishment of a modern cancer organisation in Australia had its origin in events about six or seven years after the end of the war. A group of public-spirited individuals formed a cancer treatment and research committee in Sydney, appealed for funds and raised £130,000 in Sydney and New South Wales. The successful treatment of an Australian patient by radium in America, under conditions which attracted some public attention, led also to representations being made to the Commonwealth government pointing out the necessity for the provision of satisfactory radium treatment in Australia. As a result of further inquiries this government decided to purchase 10 g. of radium, and a radium advisor was appointed to see that it was properly distributed and effectively used.

Shortly before the actual purchase of the radium the Minister for Health appointed a cancer advisory committee of prominent medical men and scientists to advise on any steps which should be taken in connexion with the new cancer movement in Australia. It was stated in the first instance that the government did not intend to supply all the money and material necessary for the establishment and equipment of cancer centres. At the same time the Minister encouraged local effort by grants to each research and treatment fund as it was raised. To New South Wales, Queensland, South Australia, and Western Australia, the Commonwealth government gave £5000, while in each instance the separate State governments gave to their own State funds a like contribution. So far Victoria and Tasmania, although they have contemplated action, have not fallen into line in this respect.

In Sydney the cancer research committee has been constituted a committee of the University, and a similar organisation has been created in South Australia. In Queensland a separate cancer trust has been formed which carries out its work as a completely independent body. In Western Australia the money was largely raised by Perth Hospital with outside help for a definite purpose, and when this object was achieved the fund was closed.

THE RADIUM CENTRES.

The national organisation which has been largely built up round the Commonwealth purchase of radium has been developed along well-defined lines. It was recognised in the beginning that for the public to receive the maximum benefit for radium treatment it must be administered only by those competent through experience and teaching to give it, and that for the further purpose of rendering the radium treatment offered more efficient, the radium should be located at large centres where considerable quantities of radium were available. It was, therefore, decided to establish one radium centre at each of the six capital cities. This rule has been fairly strictly applied, but in a country of the size and with the sparse population of Australia it has been found necessary to make a limited number of modifications.

Thus Townsville, in the North of Queensland, which fulfils the functions of the commercial capital of that district and is situated nearly 1000 miles from Brisbane, was given a small supply of radium. The large town of Newcastle was also brought into the scheme, while Launceston, which offers facilities practically equal to those of Hobart in Tasmania, was also constituted a sub-centre. Bendigo was the only other town thus favoured.

It is understood, however, that only a limited amoun of work, more or less clearly defined, ought to b done at these sub-centres, and that any case requirin treatment by large quantities of radium must be sen on to the main capital centres. If there is any doub cases are always advised to attend at a main centre and the requisite arrangements are made.

In each capital city the radium and cancer centre i established at the main teaching hospital, or in th event of there being no medical school, at the larges public hospital. In Sydney and Adelaide, wher each cancer research committee is a committee of th University, the University has been given charge o the radium. In Brisbane, Melbourne, Perth, Hobart and the minor centres, the radium has been placed i the custody of the local authority governing th hospital. The radium assigned to each hospital ha only been lent, and the loan has been made on term definitely set out in a signed agreement. This agree ment lays down the conditions under which the radium must be safeguarded, controlled for treatment, an made available for instructional purposes. It als sees, so far as an agreement can, that the investigatio treatment, and follow-up of cancer cases is carrie out in a proper and scientific manner.

The local authorities in addition to the radium hav provided, out of their local funds and subsidie deep X ray machines for cancer treatment, and th accommodation and staff laid down as necessary b the Commonwealth Department of Health. Notes cases are written on an official case-sheet which provided by the department and used throughou the continent.

In every centre the Commonwealth recommendatio has been carried out of establishing a treatment consulting committee consisting of a limited numb of surgeons, physicians, and specialists which meets regular intervals to consider, discuss, and institu the best means of treatment of the cancer cases referre to the centre, and, at the same time, a director ha been appointed for each centre in general contr of the radium and X ray work and acting as represen ing the committee in its absence. Usually the direct is a radiologist, but in one or two cases a surgeon physician has taken on the work and devoted himse almost entirely to it. This statement leads to anoth point—namely, that the Department of Health ha been insistent throughout that nobody shall hand radium unless he promises to give a certain defini minimum amount of time weekly to the work. Th correct use of radium demands a very considerab special knowledge on the part of the therapist ar as, in the majority of cases of serious cancer, th patient has only one reasonably good chance of succe from treatment, it is felt that it would be whol against the public interest to let patients take th risk of submitting to inefficient radium or X ra treatment. In the same way it is felt, that as mo cancer patients can travel, it is better for them to g to get satisfactory treatment at a big centre than th they should have inefficient treatment provided at their door.

In some States free railway passes are given to po patients travelling to the main centres, and it hoped that in due course the local authorities w be able to see that accommodation is provided f country patients who come to the metropolis whi they are waiting for radium treatment, or that th organisation is so worked out that the period waiting is negligible. It is usually found that th cost of keep and the loss of time and work is a great financial burden and domestic difficulty than th provision of the railway fare.

DIAGNOSIS AND RESEARCH.

The question of the diagnosis of cancer apart fro its treatment has received much consideration. the great cities adequate facilities for the micr

opic examinations of tumours is provided, and these cilities are rendered as simple and inexpensive as ossible. In fact, in the majority of instances istological examinations can be obtained free of harge. In Perth part of the cancer fund that has een raised is being expended on the provision of a ell-equipped pathological laboratory for the examina-on of cancer patients. This laboratory will constitute part of a complete cancer block which is in the course erection.

Some considerable time before the recent cancer ovement began in Australia the Commonwealth epartment of Health had started and carried it the policy of providing and staffing pathological boratories in many of the smaller centres which were ot well equipped with facilities for pathological aminations. These laboratories have been very ccessful, and are available in all those districts in hich they are established for the early examination pathological material taken from suspected cancer ses.

Research on a considerable scale is being conducted irectly under the auspices of the cancer research mmittee of the University of Sydney, and although ny aspect of the subject may be considered by this ganisation, it is taking particular interest in the oblems which arise in the course of the study of e action of X rays and gamma rays on tissues, and e application of observations on the fundamental ructure of organic and inorganic matter to cancer search. Research is also carried on with the help the Commonwealth Government subsidies in elbourne and Adelaide. Dr. Thomas Cherry carried t his work on the relationship of tuberculosis and ncer under these conditions, while the influence of et and other factores in the promotion of certain ood diseases and tumours in mice has been vestigated at Adelaide University. This work is ing continued under the auspices of the cancer search committee. At the Commonwealth Serum boratories at Melbourne a particular line of cancer vestigation has also been undertaken and is in ogress.

Research is being encouraged where possible at ery cancer centre, and an endeavour is being made to nduct the radium, X ray, and other treatment with is end in view. The centre is always prepared to tempt other forms of treatment besides the usual es by means of surgery, radium, and X rays. Lead eatment has not been very successful in Australia, ile diathermy has largely developed into an cessory rather than a primary method of cancer eatment.

The Department of Health acts as a coördinating ctor between all the cancer centres that have been tablished, and through the Cancer Supplement of e official journal *Health* publishes articles of interest cancer matters and gives items of news in respect the action which is being taken by different local thorities. Various of the States have published sters and pamphlets giving information to the blic on cancer, and the department is also interested this type of work and other publicity methods.

TELECURIETHERAPY AND EMANATION.

An attempt has been made to give full facilities r radium work. In the first instance 4 g. of radium ere mounted in a temporary container for administer-g "mass treatment" at the Melbourne Hospital. is treatment was carried on for a number of months fore necessity compelled the breaking up of the dium source and its distribution. This action is much regretted, as it had been intended to carry the work on a much bigger scale, but it should stated that there was a certain amount of sappointment in the results obtained while it was use. Arrangements have now been made to provide dium at Melbourne and Sydney for use as a radium omb." Melbourne has 1 g. of radium available d in use for that purpose and Sydney slightly less. A departmental emanation centre has been ablished at the University of Melbourne. The emanation provided is available to recognised centres which fulfil the conditions imposed by the Department of Health. The idea of establishing the radon centre was partly that it might be useful to fill gaps in the cancer organisation and might be employed in the treatment of those rare cases in which the necessity of travelling to a main centre would be a genuine hardship. But it was regarded as of still greater importance because it would provide a malleable source of radiation available for any rapid change in technique or for investigation; besides which it was felt that certain techniques, such as the gold "implant" technique of the Memorial Hospital, New York, and the special technique of Muir, also of New York, for the use of emanation ought to be tested and developed. Already it has been possible to institute certain improved methods in the mounting of emanation for treatment. The radium emanation is now in daily use.

An emanation station is also now complete and producing radon at the University of Sydney under the charge of the university cancer research committee. Emanation depôts for the carrying on of specialised emanation treatment and research are also in process of development at each of the other State capitals of the mainland. In every case a trained physicist will be in charge of the emanation station, which is placed under the general control of the University.

(To be concluded.)

THE DUTCH PESSARY.

To the Editor of THE LANCET.

SIR,—With reference to Dr. Norman Haire's letter on p. 225 of your issue of July 26th, I would like to make some comments on our experience of the Dutch rubber cap at the North Kensington Birth Control Clinic. The purpose of this design of cap is to be a diaphragm across the vaginal passage. To achieve this object, the circular rim must lie closely in contact with the vaginal walls, without the patient being conscious of its presence. In theory there are two levels in the vagina where this can be attempted; one, as high up as the length of the cervix will allow, and the other low enough to ensure that the anterior section of the rim is in immediate contact with the posterior surface of the pubic symphysis. The slope of the bone then acts as a stop to the downward passage of the cap rim when intra-abdominal pressure is exerted. As long as the circumference of the cap is large enough to maintain contact with the vaginal walls at every point, it does not matter at what degree of obliquity the plane of the rim lies.

Dr. Haire does not state clearly what is his aim in choosing the best size of cap for each patient. I have found that the higher level, although theoretically sound, has two practical objections: first, the vagina tends to become smaller in diameter at higher levels than at the lowest level, therefore a cap which fits a higher and smaller diameter tends to slip down and out when the patient moves or defæcates; second, many patients have not long enough fingers to reach the rim in this position, and so there are difficulties in extraction.

My aim in choosing the best size of Dutch cap is to find the smallest circumference which will remain snugly in contact with the symphysis when the patient exerts strong intra-abdominal pressure. I have found that a size which only just fulfils this condition neither comes out nor gives any discomfort, nor is its presence noticed by the wearer.

Unlike Dr. Haire, I have found that no type of cap is reliable when used alone. Sperms are able to swim up the moist vaginal walls past the rim of any cap. Our records contain several cases of failure from this cause; the patients' supplies of chemical spermaticide run out, and they trust to the cap alone, and after long periods of safety they conceive. At our clinic I no longer advise douching. I use the

small (grs. 2) pellet of quinine and urea hydrochloride made by Parke, Davis and Co. It can be inserted either above or below any type of cap. If it is used above I find quick solution is effected if a small quantity of water is first poured into the cap, and the pellet put into the water. Our patients much appreciate the added simplicity of this method, and the freedom from the habit of douching, a procedure which presents serious practical difficulties to many of them. A douche is unnecessary, because it is desirable that the quinine solution shall remain in the vagina as long as possible.

I am, Sir, yours faithfully,
HELENA WRIGHT.

IN THE MATTER OF AGE-LIMIT.

To the Editor of THE LANCET.

SIR,—I would like to endorse Ex-Temporary Civil Servant's letter in your issue of July 26th. It seems odd that committees who individually would never think of employing youthful and inexperienced doctors, no matter how keen or well qualified, are so ready to impose an early age-limit in the making of public appointments. Evidently experience has no value in this connexion, yet the same committee members acting on the boards of voluntary hospitals would most certainly consider age and experience as weighty factors in choosing the permanent staff.

In the first case there may be thirty or forty candidates to choose from, but the job goes to one of the juniors; in the second, with a field of possibly half a dozen, the younger men have no chance! Superannuation schemes are not the only explanation, although they frequently act to the disadvantage of medical employees. Medicine and surgery are still practised as they should be in most voluntary hospitals, but the practice of public health entails a series of special work which only the younger men will undertake with a view to special employment.

It may be added (and may I be forgiven for mentioning such a thing) that a certain forgotten episode known as the Great War made some of us middle-aged assistants five years older, five years wiser, and five years poorer.

I am, Sir, yours faithfully,
AN ASSISTANT MEDICAL OFFICER.

HEALTH IN WEST AFRICAN SERVICE.

THE report on vital statistics among non-native officials in West Africa shows a slight increase in the death-rate, from 6·7 per 1000 in 1928—a record year—to 7·7 per 1000 in 1929. It is interesting that of these deaths, 33 in all, only eight were due to tropical diseases: six cases of blackwater fever, one of typhoid, and one of malaria associated with lobar pneumonia. The remainder were due either to accident or such causes as cardiovascular degeneration and broncho-pneumonia, or appendicitis and other surgical conditions. The invaliding rate has decreased from 11·7 per 1000 in 1928 to 10·1 in 1929, the lowest figure yet recorded.

The remarkable improvement in the condition of the country is indicated by comparing some of the figures for 1903 with those of 1929. The death-rate per 1000 in 1903 was 20·6, and the average length of service of those who died was one year and nine months; the corresponding figures for 1929 are 7·7 per 1000, and eight years. Invaliding in 1903 reached 65·1 per 1000, with an average length of service of two years; now the average length of service is eight years two months, and the invaliding rate has fallen to 10·1 per 1000, as noted above. Another comparison can be made on the average length of service on termination: two years and four months in 1903, now eight years and two months.

It may be noted that the rates per 1000 of deaths and invalidings are lowest at the age of 30 years, and that while the death-rate is higher at 25 than 35, the invaliding rate is considerably higher at 35 than at 25; the second fact is possibly responsible for the divergence in the death-rates.

In his Chadwick lecture on Health in West Afric (THE LANCET, 1930, i., 843) Prof. D. B. Blacklock dre attention to the extreme expense of sanitary measure expense which handicaps sanitarians in their attem to eradicate disease with limited financial resource It must also be remembered that, though the repo of vital statistics already mentioned indicates th improvement in health among a certain part of th white community, it is no index of the health of th native population; Dr. Blacklock referred to some the diseases prevalent among the West Africa natives, and described the difficulties of treatmer where the medical service is limited and ideas sanitation primitive.

OPHTHALMIC HOSPITAL IN JERUSALEM.

THE report of this hospital, founded by the Ord of St. John, shows that it continues to do good wo in spite of a falling off in the numbers attendi during the year 1929. This was due to the disturl ances which took place last August, when Jerusale was in a state of siege for a week. The work of th six ophthalmic clinics in different parts of Palesti was also hampered; nevertheless the total numb of patients examined in the hospital during the ye was over 15,000, in the clinics over 14,000. Of th operations performed, over one third were on accou of trichiasis. The hospital is the possessor of tv plaques of radium. During the year, eleven patien were treated with radium, seven of them being cas of spring catarrh. Of the new patients seen, many as 92 per cent. were trachomatous. Accordi to the report the spread of trachoma is fostered l epidemics of acute conjunctivitis which, of lat have been unusually severe in Palestine.

TREATMENT OF ANAL FISSURE.

R. Bensaude and co-workers[1] have lately record their experience of the treatment of anal fissure by t method described by A. B. Graham in America in 192 Graham injects 5 per cent. quinine-urea solution und the base of the fissure, and F. C. Yeomans, in his bo on "Proctology," reports that this has given 70 p cent. of successes. Bensaude calls attention to t severity of the "fissure crisis" and the inten sphincteric spasm, which may last for ½ to 7 or 8 hou Palliative treatment has little effect and dilatati under anæsthesia is often required. The meth described is an ambulatory one, and all that is necessa is to inject about 0·25 c.cm. of the solution sup ficially under the external half of the fissure. Pu chthyol is applied to the surface. The injection painful and must be done rapidly; a very fine need is required. The injection may have to be repeat at intervals of 2–3 days. In Bensaude's small ser of about 20 cases all the patients benefited by t treatment and 11 lost their anal symptoms; in slight pain persisted at defæcation. In at least 7 the cases the fissure was anatomically cured. T defect of Graham's method which has impress English surgeons is the pain it causes. W. B. Gabri says that good relaxation of the sphincter can obtained by injecting a preparation called A.B. which is prepared for him by Messrs. Allen a Hanburys and is a 3 per cent. solution of anæsthes with benzyl alcohol 5 per cent. and ether 10 per ce in sterilised olive oil. Perhaps a combination of th methods would give satisfactory results.

"PERPLEXED" writes:—I should be much oblig if some of your readers could suggest some che absorbent material for a patient of mine with artificial opening, following operation of diverticulit to absorb the fæces, as she has to use large quantit of wool.

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[1] Bensaude, R., Cain, A., and Lièvre, J. A.: Bull. et Mé de la Soc. Méd. des Hôp. de Paris, 1930, xlvi., 13.
[2] Brit. Med. Jour., 1929, i., 1070.

ADDRESSES AND ORIGINAL ARTICLES

SYPHILIS OF THE HEART AND GREAT VESSELS.

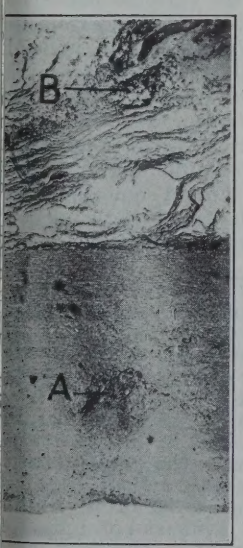
By Carey F. Coombs, M.D., F.R.C.P. Lond.,
PHYSICIAN, AND IN CHARGE OF THE UNIVERSITY CENTRE OF CARDIAC RESEARCH, GENERAL HOSPITAL, BRISTOL.

LECTURE III.*

Changes in the Aorta.

The most constant and at the same time the most striking lesions seen histologically are those in the wall of the aorta. These are not always easily discriminated by the naked eye from those of atheroma with which in fact they are often mingled; yet histologically the two lesions are as different as possible. The syphilitic lesion is inflammatory while the other is degenerative; the one invades the media from the adventitia along the track of the vasa vasorum, while the other, beginning and centring in the intima, encroaches upon the adjacent part of the media. In one respect, indeed, they are alike, in that each is capable of breaking up the elastic fibres of the aortic wall, but even here there is a difference, for syphilis breaks into those fibres oftener and far more seriously than does atheroma. Syphilitic aortitis is a chronic inflammation (Fig. 5), marked histologically by mononuclear response (Fig. 6) which is seen scattered about in the peri-aortic connective tissue, and banked up in the adventitia, against the outer aspect of the media. Here the cells—lymphocytes, plasma cells, and some fibroblasts—collect round the vasa vasorum, and around them enter the media from without inwards. In the media spaces form between the fibres, which tend to spread along and around the vessel. These become filled partly with the inflammatory cells, partly with new blood-vessels, partly with new fibrous tissue. As these new elements spread they tend to become connected with one another and thus to break off the elastic fibres by which they are bounded. By this process of coalescence large spaces (Fig. 7) and long fissures are formed, gravely lowering the value of the aortic wall as an elastic and resilient structure. It is easy enough to see from the picture of any syphilitic aorta how aneurysms, both saccular and dissecting, are formed. Indeed it is wonderful that any syphilitic aorta fails to become aneurysmal. One change that tends to prevent this is the fibrous thickening of the intima that is formed, like a kind of dam, opposite the weaker places in the media (Fig. 8). This is so obvious that it is impossible not to regard the two phenomena, medial thinning and intimal thickening, as cause and effect. This thickened intima may subsequently undergo fatty change and calcareous infiltration, thus producing a kind of atheroma; yet a kind quite different from that seen in senile or decrescent arterial change which begins in the intima and leaves the adventitia untouched.

Fig. 5.



Low-power view of section through wall of syphilitic aorta.

Fig. 6.

Higher magnification of area marked A in Fig. 5, to show mononuclear infiltration with vascularisation in the media.

Some accounts of these lesions ascribe great importance to changes in the walls of the vasa vasorum, labelled endarteritis. I believe, however, that it is a fallacy to suppose that the characteristic change in the vasa vasorum is intimal. The reverse is true, for there is an intense cellular reaction around these vessels which follows them on their course into the media, a fact which shows quite clearly by what channels the virus of syphilis breaks through the aortic defences. Any change that can be marked in the walls of these small nutrient vessels surely arises from the outside. At all events, that change is as much medial as intimal and, though it may amount to complete occlusion of some vessels, could scarcely be held responsible for so gross an injury to a first-class tissue as is to be seen in the media of the syphilitic aorta.

Considered longitudinally, this process often fades into normal aorta within a short distance from the root of the vessel, which it usually encircles. It is on the sigmoid and suprasigmoid portions that the chief stress falls. At the cardiac end of the tube the process ends abruptly, not passing down into the ventricular walls as a rule. I found no example of spread in this direction. The wave spends itself and is checked. Yet in ending here the inflammatory process involves two structures of vital importance: the mouths of the coronary arteries and the aortic semilunar valves. This stenosis of the coronary mouths is a most striking pathological change, as striking both by reason of its individuality and of its consequences as, say, mitral stenosis. What is so remarkable is to see the inflammatory reaction leave off abruptly as the aorta passes over into coronary artery. The walls of the coronary arteries themselves are scarcely ever touched by this invasion. Nevertheless it comes right down the aortic wall to the very angle of the coronary opening (Fig. 9), and at this point the adventitia is intensely inflamed. It is easy to see how this leads to a fibrosis round the orifices of the coronary vessels

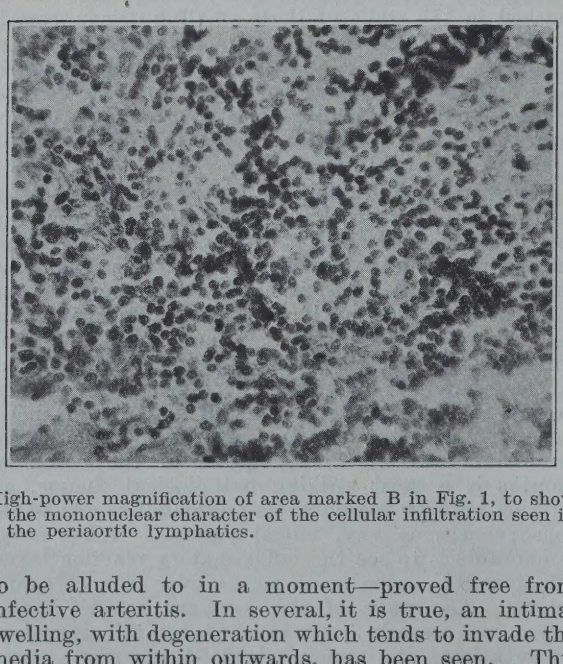
* The third Lumleian lecture. The previous two lectures appeared in THE LANCET of August 2nd and 9th respectively.

by which these are nipped in an ever-tightening strangle-hold.

Scarcely less remarkable is the effect of this ring of inflammatory change on the aortic semilunar cusps. If the commissures between neighbouring cusps be examined, they are often seen to be swollen, and the swelling has spread into the adjacent portions of the cusps themselves. These are thereby stiffened and shortened, and thus tethered at their aortic attachments in such a way as to render them inadequate. With the microscope this swelling is seen to be partly inflammatory (Fig. 10), partly œdematous. Scott and Saphir[46] find that œdema precedes cellular infiltration. Whether this is so or not, both changes are seen, sometimes one, sometimes the other being predominant. The endothelium tends to proliferate and to be shed at this, the commissural, end of the valve cusps, which may thus become adherent to each other or to the aortic wall. From the frequency with which the cusps perforate at this part of their extent—the "reticulation" described and figured by Corrigan—it seems that this process involves them in a kind of dystrophy; or perhaps these accidents are wholly due to the tethering effect of the infiltration at the commissural margin of the cusp. Immediately beneath the swollen and inflamed commissure, which is a kind of cushion of subintimal connective tissue, the media usually exhibits the characteristic syphilitic reaction (Fig. 11).

So far, then, this is the picture: an inflammation reaching the aorta from without, invading and breaking up its middle coat, and spreading heartwards until it stops at the level of the sigmoid portion, where it strangles the coronary arteries and ties down the aortic semilunar cusps. This stricture of the coronary mouths (Figs. 12, 13) is all the more striking because the coronary arteries beyond are free from disease. That this is so is proved by section of the coronary trunks and branches, which have in all cases but one—

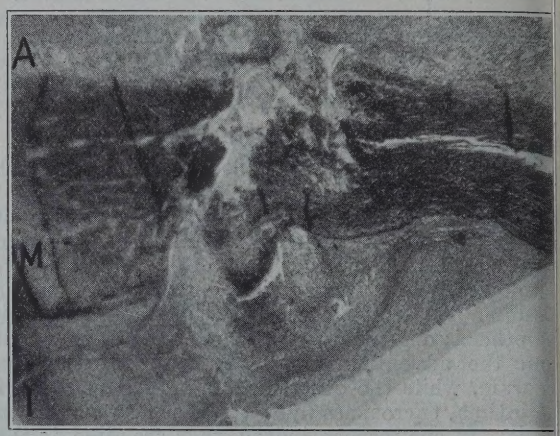
FIG. 7.



High-power magnification of area marked B in Fig. 1, to show the mononuclear character of the cellular infiltration seen in the periaortic lymphatics.

to be alluded to in a moment—proved free from infective arteritis. In several, it is true, an intimal swelling, with degeneration which tends to invade the media from within outwards, has been seen. This appears to me to be identical with the atheromatous change from which the coronary arteries of persons over 50 are seldom quite free. I do not think there can be any doubt that the coronary arteries themselves are very rarely attacked by syphilis, and this view is strikingly supported by some observations which Dr. Bruce Perry kindly undertook on my behalf. He injected into the coronary arteries of five hearts showing signs of syphilitic infection an opaque

FIG. 8.



Low-power view of section of aortic wall stained with orcein to show rupture of elastic fibres of media by the syphilitic process with compensatory thickening of intima. A=adventitia. M=media. I=intima.

substance, after the method used by Gross, Campbell and others; and by X raying these specimens was able to demonstrate the freedom of the coronary arteries and their branches from any stricture (Fig. 14). This freedom from interruption in the course of the vessels forms a striking contrast with the extreme stenosis of its mouth. An artery of which the openings from the aorta are so narrowed as to be almost invisible nevertheless opens up immediately afterwards into a tube with smooth walls and normal calibre. In senile or "decrescent" hearts, on the other hand, the bore of the coronary arteries varies greatly and exhibits may strictures. The pulmonary artery, examined by me in nine cases, showed some departure from the normal in four, the changes being similar to those in the aorta but much less pronounced.

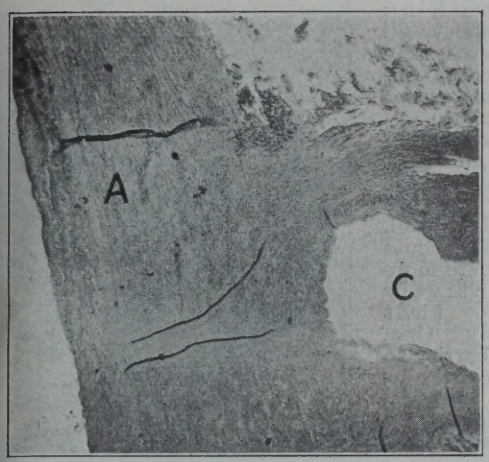
LESIONS IN THE MUSCULAR WALL OF THE HEART.

The muscle cells.—In most of the hearts examined some evidence of malnutrition of the myocardial cells was found. Usually this was mild in degree and scattered in distribution. For example, the auricular walls in three instances showed the same kind of fatty change that is seen in them in advanced cardiac rheumatism—similar in kind but by no means so severe in degree. In six cases the walls of the ventricles, in which it is usually more difficult to detect these degenerative phenomena than it is in the auricular walls, showed clear evidence of impaired nutrition in the form of fatty change, and even more definitely in a shrinkage of the total volume of the cells. In two hearts the fibres of the auriculo-ventricular bundle showed the same kind of change but I did not see it in any sinu-auricular node. Once only did I find a gross focal lesion of the muscular tissue: a wedge of necrotic muscle, free from inflammatory reaction, in the upper part of the interventricular septum (Fig. 15). Near this there were some lesions of arterioles.

The *connective tissue planes* of the cardiac wall undergo three kinds of alteration. The one most often seen is an increase of fibrous tissue that takes place with little or no inflammatory reaction. In the areas where this is seen the muscle-fibres are reduced in number and size, and it is therefore a "replacement

rosis. In some degree it is present in most philitic hearts. The largest areas that I have en were in a papillary muscle of the left ventricle, d in Dr. Herapath's case, already mentioned, here scar tissue and fat cells had almost entirely

FIG. 9.



w-power view of section of aorta at origin of a coronary artery, showing adventitial and medial lesions of aorta. Note hat these lesions, while sparing the coronary wall, are so situated as to constrict the coronary opening. A = aortic wall.) = lumen of coronary artery.

placed the muscle-fibres of the auriculo-ventricular ndle. I examined the bundle in twelve cases but nd no gross connective increase in any of them, r in the sinu-auricular node, examined thirteen nes. The absence of frank inflammatory change s a great surprise to me. Only in one heart did I a granulomatous focus. This was very small l well out of the way in the subpericardial fat. several thousand sections of cardiac muscle did not once see a granuloma. When an erative endocarditis was added to the syphilitic ion, embolic foci were noted in the cardiac wall. is is the rule in warty endocarditis. The third d of change is an interesting one. It has been cribed before and regarded as an inflammatory ction to infection. The appearances are those of weak cellular response—a few plasma cells and phocytes—drowned in serum, which gives the ues a dropsical appearance (Fig. 15). It is icult to think that the same infection which can ite so brisk a reply in the aortic wall should be able rovoke in the cardiac wall nothing better than this tery response. In over 100 hearts damaged by er infections nothing quite like it was seen.

We have been told by some observers that this is an ammatory reaction excited by spirochætes lying nt in the cardiac wall, and as this is a point on which ne but the most experienced observer can offer an nion, I called on Prof. Levaditi last autumn at the steur Institute. He was kind enough to undertake examination of portions of two hearts in which we l already found aortitis and myocardial fibrosis on enerous scale. He reports as follows:—

"We have examined the blocks that you sent by the er impregnation method, that up till now has given the most reliable results. We have found it im- sible to demonstrate spirochætes, in spite of the ence of aortitis. We shall continue to search, and report if we find anything positive."

oming from so experienced an authority this dict has peculiar weight; it is at all events clear that pirochætes are in the myocardium they are so few o be very difficult to find.

nother surprise has been the freedom of the nary twigs from inflammatory change. One s, of course, medial hypertrophy in hearts that are themselves hypertrophied, and atheromatous change in subjects of the appropriate age. But only one heart has shown signs of an actual arteritis in these twigs, and in this instance both media and intima were involved, the limiting elastic lamina being disintegrated (Fig. 16). It was near to these arteriolar changes that the wedge of necrotic muscle was noted of which I spoke just now. My interpretation was that arterial disease in this area had ended in the formation of an infarct.

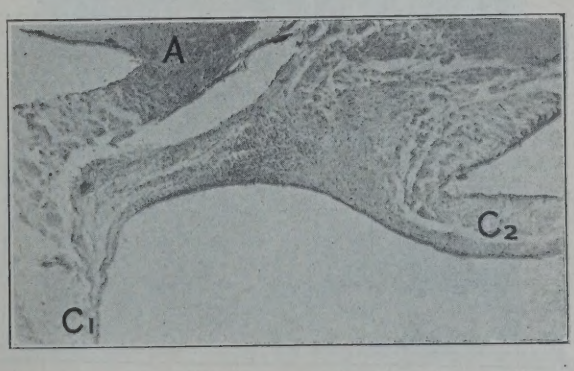
Blood-vessels.—I must here record what was to me the most significant and revealing of all the phenomena noticed in the cardiac wall. As I was making notes on changes seen in sections of the interventricular septum, something which I had never seen before in the cardiac wall struck me, and I wrote down "large venous sinuses immediately under the endocardium." These were obviously associated with muscular atrophy and fibrous increase (Fig. 17), as they ran through the centre of atrophic areas. On reflection it was borne in upon me that these were the dilated Thebesian veins that Wearn[63] has described and, as in his cases, they were associated with stenosis of the coronary openings. In hearts injected by Dr. Perry the injection mass did not seem to have penetrated these sinuses.

Rheumatism and Syphilis Contrasted.

We are now in a position to reply to the four questions that prompted this histological inquiry. These are arranged so that one reply may in some measure clear the ground for the next.

(1) The aortic valves are rendered liable to the implantation of secondary infections by a process that is radically different from that of the rheumatic infection. In rheumatism the infective agent enters the depths of the valve from the coronary stream, excites a reaction there which, so to speak, bursts the valve, or at all events floats off its endothelium, leaving a roughened and injured surface. In syphilis the process also begins in the depths of the valve, and causes it to swell, until here also the endothelium is injured and desquamates. The raw surface may become adherent to its neighbouring valve or to the aortic wall, or it may invite and receive a deposit of clot, with micro-organisms laying therein the foundations of an endocarditic vegetation. But the syphilitic injury is inflicted, not through the medium of the coronary blood-supply, but by lymph-borne virus

FIG. 10.



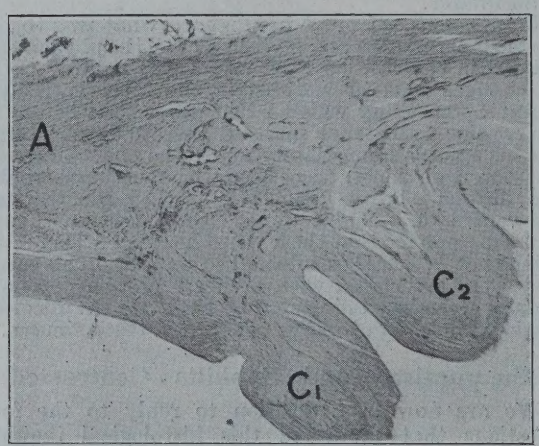
Commissure from which two cusps (C_1, C_2) of the aortic valve spring, showing early cellular infiltration. A = aortic wall.

which filters from the adventitia through the media till it is arrested at the valvular attachments and especially at the commissures (perhaps because it reaches these first). Here it causes an inflammation which interferes with the flow of lymph through the valvular tissue, rendering it both œdematous and fragile. As this process is limited to the commissures and adjacent parts of the cusps, it is interesting to note that here also—in the only early specimen I have seen—the

infection that provoked an ulcerative endocarditis seems to have been implanted.

(2) Lesions of the sinu-auricular node and the auriculo-ventricular bundle were not found. Such changes as have been seen in the cardiac wall are almost exclusively dystrophic; these are found in

FIG. 11.

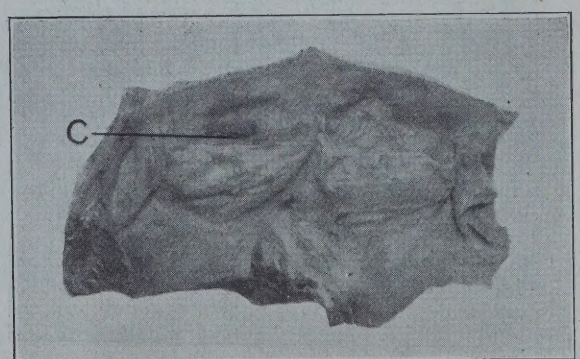


Another commissure showing vascularisation of the media concentrated at this point. A = aortic wall. C_1, C_2 = cusps of aortic valves, cut off short.

all cases, whereas definitely inflammatory foci were almost non-existent. Whatever else may be laid to the charge of the syphilitic spirochæte, it cannot be accused of remaining alive in the cardiac wall in such numbers as to provoke an obvious inflammatory response.

(3) The absence of cardiac infarction is easily explained. There is no disease in the coronary arteries and therefore no occasion for clotting within their lumen. This absence of gross coronary disease is a very striking fact, since it goes a long way to prove that the cardiac failure of late syphilis is not due to the transmission of the infection into the myocardium along coronary avenues. The frequency with which cardiac pain is experienced in cardiac syphilis is

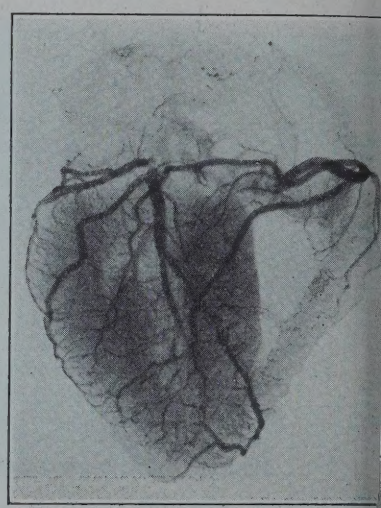
FIG. 12.



A coronary opening C much narrowed by aortic syphilis.

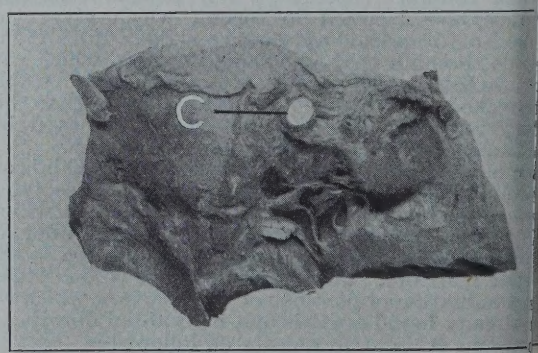
probably related to the obstruction of the coronary orifices. Perhaps it is also in part due to the periaortic inflammation, which may surround the nerve trunks, though without, as far as my observation goes, invading them; and it may be that this element is responsible for the fact that pain in cardiac syphilis may often occur apart from exertion or other obvious provocative. This periaortitis is a striking phenomenon, and one cannot be surprised at the impression that it made on the mind of Clifford Allbutt, who w so familiar with it. Yet cardiac pain occurs when the is no periaortitis, as in atheroma and hyperpies and even when there is no gross change in the arter tree, as in a few cases of pernicious anæmia. I can see nothing common to all these widely diverse conditions except a failure in the supply of oxygenated blood to the cells of the cardiac wall. Nothing could interfere more effectively with that supply than the barrier to coronary inflow which aortic syphilis imposes. The Harvey film of this College showed the beating heart paling in systole and flushing in diastole, flushing because its coronary arteries are filling w blood, as Anrep has taught, and passing that blood to the rich capillary system with which the muscu wall of the heart is endowed. But if the coron openings are so narrowed that blood cannot be dra through by the ventricular relaxation, what is happen? To this question two sets of facts re eloquently; one of them, the liability of the syphili heart to sudden suspension of work; the other, state of the cardiac wall as revealed by the microsco The cardiac wall demands blood in diastole but is appointed by the coronary stricture, and has to pu

FIG. 14.



Radiogram of heart from which Figs. and 13 were taken. The coronary vesse which have been injected with an opac substance, show no stricture or ot gross deformity.

FIG. 13.



The same coronary vessel C immediately after its origin, inj to show that the narrowing is limited to the orifice.

with such meagre supplement as it can get from Thebesian veins. Small wonder that the mu fibres shrink and are replaced by fibrous tissue. dangerous a matter as this starvation of one of vital tissues must make itself known some whenever the demands of exercise threaten to g far; and that protest takes the form of stenocard plain hint that cannot be ignored.

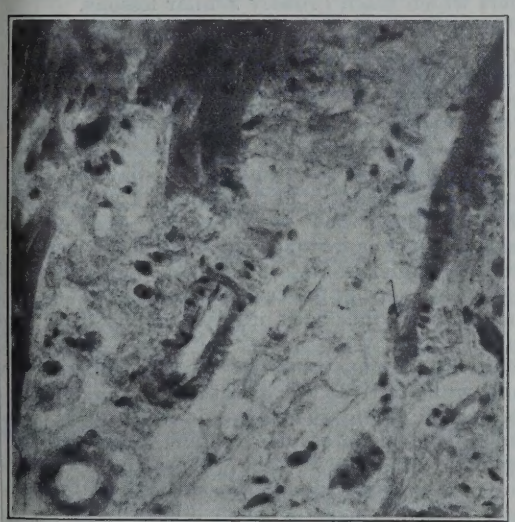
(4) The last of our questions, that which asks

ese lesions take so long to develop, cannot be swered with full assurance. Yet I believe the idence furnished by a consideration of the histo- gical facts justifies certain significant deductions. o one approaching these facts without bias can fail be struck by the fact that the most constant and rious lesion is an inflammation of a productive nd in the tissue immediately surrounding the aorta. ow Klotz,[33] in 1918, wrote an important paper which s been somewhat neglected, though not by Clifford lbutt, who recognised its value when speaking on sceral syphilis in 1921. The burden of this paper as the significance of the lymphatic arrangements the aortic sheath, especially as these concern the stribution of the syphilitic virus.

THE LYMPHATICS AROUND THE AORTA.

This view accords with the histological facts. he inflammatory reaction is at its most intense in e connective tissue that surrounds the aorta. orbidden by the outer wall of the media to pass on a direct line, it filters through by following the asa vasorum. These are thereby soaked in poison nd their walls swell. The virus, passing in along ese small vessels, separates the layers of elastic

FIG. 15.

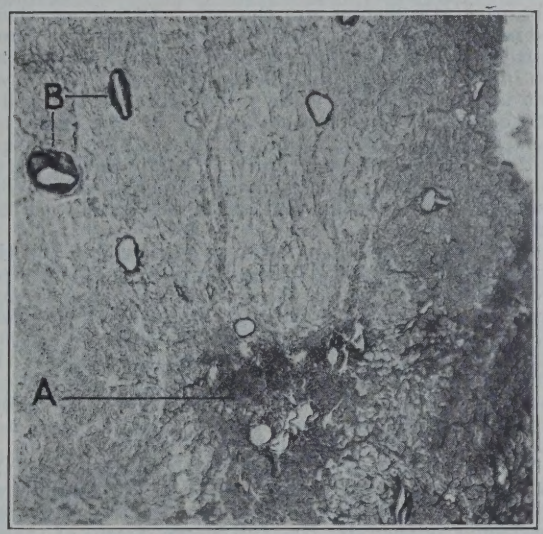


A of "œdema" in myocardium, showing a few plasma cells.

ti ue from each other, makes between them spaces fi d with inflammatory cells, organised blood-vessels, a new connective tissue, and often breaks through t elastic fibres so freely as to create wide fissures e ending through the whole thickness of the media. T intima saves the situation by buttressing the w kened media, which nevertheless may so crack a yield as to allow aneurysms to form. In any c the loss of elasticity in the aortic wall is a heavy b w to circulatory efficiency. Other blows, even n e serious, are sustained because the infective p cess spreads both within the media, along the in rfibrous planes, and without, in the periaortic ly phatics, to the aortic base, where it nips the co nary arteries and deforms the valves. The first of hese starves the ventricular wall; the second, b making the aortic valves leak, increases its work. If ome malign agency, endowed with a capacity for pu oseful activity, were to busy itself with plans fo bringing the action of the heart to an end, it co d scarcely hit upon a subtler plan than this.

he point is that these infective phenomena arise so ewhere outside the aortic wall and reach it by ly phatic channels. Whence do they come? We de ve a hint of the importance of this matter from a re nt paper by R. O. Stern[47] which Dr. Macdonald Cr hley commended to me, a paper which argues, on histological grounds, in favour of a lymphogenous origin for tabes dorsalis and suggests that it is from the aortic lesions that the toxins are derived. This is not quite the whole truth, I think, for the incuba-

FIG. 16.

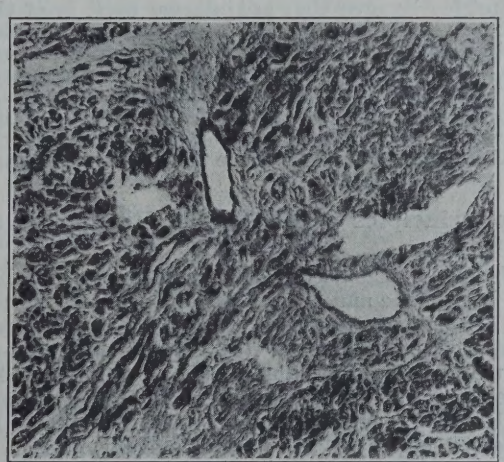


Section of myocardium showing (A) wedge of necrotic muscle, (B) arteritis of coronary twigs.

tion period of the tabetic lesion is not so long as that of the aortic. Is it not probable that there is some common reservoir of poison from which both spinal and aortic lesions are initiated?

I know that we are told that spirochætes and an inflammatory reaction are found in the aortic and myocardial tissues within a few months after infection. But the same is true, presumably, of every tissue and organ in the body. It has just been satu-

FIG. 17.



Wall of left ventricle to show dilated Thebesian veins coinciding with muscular atrophy and increase of connective tissue.

rated with spirochætes, and it would be remarkable if these inflicted no immediate injury. We know, also, that in all parts of the body remnants of this infection linger, setting up a granulomatous reaction here and there, and also inflicting permanent injuries on a few arteries. No tissue is exempt from this kind of accident; yet in the 18 hearts that were examined thoroughly, only one showed a granulomatous focus and that a small one; while only

one other displayed any inflammatory lesion of the coronary branches. On the other hand, aortitis was present in all of them. It is this, the lymph-borne lesion, that is the inevitable one; the blood-borne phenomena are comparatively rare accidents. Here again is a likeness to the nervous lesions of syphilis. Arteritis, gumma, and myelitis are the exceptions; tabo-paralytic lesions are the rule. Of course, there are in both systems examples of overlapping. Gummatous lesions may occur in patients who also display the later lymphogenous phenomena. But the broad fact is that syphilis, after it has entered the body, whether by a local inoculation or by the maternal blood, attacks both systems in three different stages and in three different ways; bacteriæmic, focal, and lymphogenous phases may be successively recognised in the heart as well as in the cerebro-spinal axis.

One other parallelism between the cardiac and the nervous lesions is that, being lymph-borne, the virus provokes a reaction in the fibrous investments that would be unimportant if it were not that vital tissues are included within those investments. Possibly, the truth is rather this, that in this last phase of the infection the lesions are more widely distributed than we suspect, but that we know nothing about them except where they attack vital organs and excite noticeable symptoms.

When we consider all these analogies between the spinal and the aortic manifestation of late syphilis we are not surprised at the occurrence of the Babinski syndrome, either in its full-blown form of tabes with aneurysm or in the less distinct developments of a similar coincidence. And we begin to ask whether it may not be more than a coincidence; whether these may be two nearly related branches of a main stream. If so, from what reservoir does that stream issue? May this not lie in the mediastinal lymph glands? Klotz hints at this, speaking of the mediastinitis that accompanies aneurysm. This is not always perceptible to the naked eye, yet it may at times lead to dense mediastinal fibrosis. I have a vivid recollection of the difficulty that it added to the removal from the thorax of a certain large aneurysm that I wanted for a museum specimen. Lymphadenitis is a prominent feature of secondary syphilis, and presumably this is as true of the glands that we cannot feel because they are internal as it is of those that we can feel because they lie externally. It is likely, so it seems to me, that within these glands the infection is apt to survive, and thence to pour out a stream of toxins which, carried by lymphatic channels, do irreparable injury to both aorta and cord. It is an interesting hypothesis, the verification or rejection of which must be left to those who have the material and the skill to use it.

The Principles of Diagnosis, Prognosis, and Treatment.

Usually a diagnosis of organic disease of the heart has been made and a cause has to be found. In cases of (1) aortic regurgitation, (2) general or aneurysmal dilatation of the aorta, (3) cardiac pain, (4) ventricular, or less often auricular, or junctional failure, especially when they occur in a middle-aged male, evidence of a syphilitic origin must be sought. It is obtained either in the patient's history, or in the presence of some other syphilitic lesion such as tabes or a periosteal node; or by a Wassermann test. Ulcerative endocarditis may have a syphilitic basis, and similar evidence should be sought if the valvular lesion be aortic. The discovery of a syphilitic element in such a case may favourably influence the reaction to treatment. Sometimes it is justifiable, even when all these modes of inquiry end in nothing positive, to treat the patient as if he had been proved to be syphilitic; and occasionally the results justify that suspicion.

There is a group of patients who, convicted of some other form of syphilis, also display doubtf signs of cardiovascular disease. Of these, Phillips[42] sa in 1897 that "evidences which we might sometim set aside as too slight to denote important cardi disease must not be so set aside in syphilitic persons

Prognosis, in the nature of things, cannot be goo once a definite diagnosis of cardio-aortic syphilis h been made. My own 103 cases have yielded a numb of data that I may summarise thus:—

TABLE VII.

Years since first seen.	Alive.	Dead.	Total.
1– 4	21	19	40
5– 8	7	13	20
9–12	1	27	28
Total	.. ..	.. ..	88

In 17 fatal cases death followed onset of symptoms in 2·5 yea

These experiences may be compared with those Mitchell Bruce, who gives 5¼ years from the onset symptoms as the average duration; of Deneke, w found 84 per cent. fatal in four years; and w others which teach broadly similar lessons.

The precarious outlook before the cardiosyphil is proverbial. In this respect the syphilitic surpas all other cardiac lesions. This is because no ot cardiac lesion so effectively reduces the blood-sup of the heart to an irreducible minimum without margin for emergencies. Evidence of coron stenosis or of the resulting myocardial starvatio therefore particularly unwelcome. I am, of cou not forgetting that we have in the occasio coexistence of aneurysm an additional reason dreading sudden catastrophes; and it is not poss to give a reassuring forecast to the relatives or frie of anyone who has been proved to suffer from car syphilis.

Notwithstanding these depressing facts, it is worth while to treat this disease thoroughly. The therapeutic axiom that I would venture to stat that a diagnosis of cardiac syphilis carries with it implication that its subject will be under treatm more or less active, for the rest of his life. It se clear, from the look of some of the lesions I h examined, that even when the syphilitic pro itself is terminated the residual damage, to the a in particular, so reduces the efficiency of the ci latory pump that the addition of other deleter processes, especially those of atheroma and arterial tension, brings to the ground a man wh he had had no syphilis might have lived ten or tw years longer. Therefore no matter how succes the antisyphilitic treatment may appear to be, ought not to forget that the more completely infection is controlled the less residual injury t will be, and the better will the patient be able to the other stresses and perils in which advan years must inevitably involve his arterial tree.

The broad plan of treatment indicated is a tinuous supply of potassium iodide and merc continuous that is, in the sense that the patient not stop it unless the doctor tells him to; superimposed on this background of contin treatment, an occasional course of organic ars For instance, one should try to persuade the pa to receive about twice in a year a course of novars benzol given in moderate weekly doses, not rising above 0·45 g. per dose, and amounting total of 5 g. in all. It is much better to sp the course out over a long period than to attem hurry through it, the difficulty being that the pa

turally wants to get the maximum amount of nefit in the minimum amount of time. Often in the ly stages he feels so well that he cannot see why much fuss is made over him, and this makes him the less inclined to be patient and persevering. My n belief, however, is that continuity in the adminis- tion of iodide and mercury is of more importance an courses of organic arsenic. A diagnosis of tic syphilis also implies unfitness for strenuous rk and for violent exercise of any kind. More- r, it imposes on its subject a need for strict temper- e in the use of alcohol.

f the sole reason for an interest in the subject that have been discussing lay in the opportunity that ffers for successful treatment then, indeed, our time uld have been largely wasted. There is, however, far stronger motive impelling us to study this ease and to make known the outcome of our dies, and that is a desire to emphasise the urgent d for prevention and early treatment of syphilitic ection. If it is a melancholy reflection that in this ease we see a wholly needless wastage of valuable s we may perhaps derive consolation from seeing t also a supreme example of the immense power of ghtened public opinion as an engine of preventive licine.

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THE BI-COLOURED GUAIAC TEST FOR THE CEREBRO-SPINAL FLUID.

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THE bi-coloured guaiac test on the cerebro-spinal fluid was introduced in 1929 by de Thurzo, who, working in the laboratory of the National Hospital for Diseases of the Nervous System, applied this new colloidal reaction to the cerebro-spinal fluid and investigated its behaviour with a number of pathological fluids.

The object of this paper is to record the results we have obtained in a further series of fluids examined in the same laboratory, and to assess the practical value of the test.

Description of the Test.

The colloidal system used in the bi-coloured guaiac (B.G.) reaction is a suspension of guaiac resin with two coloured solutions of dyes, naphthol green and brilliant fuchsin. The brilliant fuchsin tends to be precipitated along with the resin in certain pathological fluids, and thus we obtain colour changes from red to green through an intermediate, but obvious grey coloration. The B.G. solution itself is easy to prepare and gives remarkably constant reactions. Standardisation of the solution is therefore unnecessary.

Theoretical considerations of the reaction will not be discussed here, for de Thurzo has dealt with them in his paper.[1] It is sufficient to state that he ascribes the reaction to a particular sensitiveness of the colloidal system used to one fraction of the protein content of the cerebro-spinal fluid, euglobulin. A relative increase in this fraction, as found in different forms of neurosyphilis, causes precipitation of two components of the colloidal system and a characteristic change in colour. The Lange colloidal gold reaction appears to be produced in the same way. We have performed this reaction also on all the fluids in our series for the purpose of comparing the two reactions.

PREPARATION OF THE SUSPENSION.

Two solutions are required: *Solution 1* consists of 0·2 per cent. sodium chloride with 1 c.cm. of ½ per cent

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sodium carbonate added to each 100 c.cm. of saline. The sodium carbonate solution keeps indefinitely. De Thurzo suggests that the saline should be prepared freshly for each test from a stock 10 per cent. solution diluted, but we have found it advisable to make up the 0·2 per cent. solution from the dry salt each time. *Solution 2* is the bi-coloured guaiac suspension, which is prepared as follows: 0·22 c.cm. of 20 per cent. tincture of guaiac (B.P.C.) in 9 c.cm. of absolute alcohol are added to a flask containing 40 c.cm. of distilled water.

This mixing of the suspension must be done very slowly and with constant shaking of the flask. The best method of mixing these two solutions is to pipette the guaiac tincture into the water from a 1 c.cm. pipette, allowing not more than 0·5 c.cm. to be delivered at a time, and shaking well between the delivery of each few drops. As the success of the test depends on the thorough mixing of these two solutions, it is important not to hurry this step. 2 c.cm. of a watery solution of naphthol green (Gurr) are then slowly added to the suspension. The flask should be shaken after this is added. Finally, 0·3 c.cm. of an alcoholic solution of brilliant fuchsin (basic fuchsin, Gurr), is added, and the flask again shaken. *It is then left to stand for 30 minutes before use.*

A good suspension should be slightly opalescent and of a dark cherry red colour when freshly prepared. The colour fades to a light cherry red by the end of half an hour, and after twelve hours the colour is a rather dirty shade of pink. The suspension can only be used within three hours of preparation, as after this time the sensitivity alters, and anomalous results are obtained.

TECHNIQUE OF THE TEST.

Each test is carried out thus: ten test-tubes, 4 inches in length, are set out in a rack. 0·5 c.cm. of cerebro-spinal fluid is put into the first and second tubes, leaving the pipette in the second tube. 0·5 c.cm. of solution 1 is added to each of the tubes 2 to 10. The cerebro-spinal fluid in tube 2 is mixed with the saline, and 0·5 c.cm. is transferred to tube 3. Mixing takes place as in tube 2, and 0·5 c.cm. is transferred to tube 4, and so on to tube 10, from which 0·5 c.cm. is removed and rejected. The dilutions of cerebro-spinal fluid are therefore 1/1, ½, ¼ .... to 1/512. 0·5 c.cm. of the B.G. suspension is added to each tube. The rack is well shaken and set aside. The results are read after 12 to 18 hours by transmitted light, preferably by electric light.

In reading the test the alterations in colour are represented by numbers: 0 = No change. 1 = Slight precipitation, some turbidity; no change in colour. 2 = Red precipitation; upper fluid greyish or greyish-red. 3 = Red precipitation; upper fluid greyish-green to dull green. 4 = Red precipitation; upper fluid vivid green. There is no difficulty about reading the changes in colour indicated by figures 3 and 4. The only difficulty arises occasionally in deciding whether the change in colour is represented better by the figures 1 or 2. This difficulty soon vanishes with experience in reading the test.

Results.

Our series comprised fluids from patients with the following diseases (the figure after the disease indicates the number of cases of the particular disease in which we examined the fluid): general paralysis (52), tabes dorsalis (23), cerebro-spinal syphilis (11), disseminated sclerosis (21), cerebral tumour (7), spinal compression (6), cerebral abscess (2), syphilitic meningitis (2), chronic meningitis (2), polyneuritis (2), hemiplegia, cerebral thrombosis, acute meningitis, Friedreich's ataxia, osteitis of orbit, local meningitis, cerebral malaria, third nerve palsy and arthritis, one case of each. The fluids of many of the syphilitic cases, especially those of general paralysis, were examined on several occasions. The Lange reaction was done first on every fluid, and only those which gave a reading of (2) in at least one tube were used for the B.G. reaction. It was found that fluids giving a reading of only (1) in the Lange reaction did not give any colour change with the B.G. reaction, and except for control cases they have been excluded from this series.

The results indicate that the B.G. reaction clos resembles the Lange reaction in its behavio towards syphilitic fluids. The only fluids wh produced complete precipitation in any tube w a clear green supernatant fluid in the B.G. reacti were, with a very few exceptions, those from cases general paralysis. The exceptions were: a case polyneuritis with a protein content of 1 per cen two cases of tabes dorsalis, and three cases of disse inated sclerosis. Reference to these cases will made later. We found that, with the exception ag of certain cases of disseminated sclerosis and cases with an exceptionally high protein conte precipitation represented by figures 2, 3, and occurred only in neurosyphilis. The increase protein content necessary to produce a very sli precipitation of the B.G. suspension produced very definite "shift to the right," or mening curve, in the Lange colloidal gold suspension. example, a fluid from a case of polyneuritis wit protein content of 0·45 per cent. gave a La reaction of 0001123333, but a completely negat B.G. reaction.

Whatever the theoretical basis of the react may be—i.e., whether the colour change is due an increase in the proportion of euglobulin or no it is clear that the B.G. reaction is decidedly m sensitive to syphilitic fluids, however low th protein content, than to non-syphilitic fluids wit very high protein content. The B.G. suspens thus seems to be more selective in its reaction tha the Lange gold-sol.

GENERAL PARALYSIS.

The majority of fluids from cases of gen paralysis gave a reading of the type 244444 It was rare to find complete precipitation in the tube—i.e., with undiluted cerebro-spinal fluid. strongest reaction was seen in the third tube practically every case. Not uncommonly a sl reaction in the first tube was followed by comp precipitation in the next six, a reaction of the t 1444444211. In only eight out of our 52 fl from cases of general paralysis was there less t complete precipitation in at least one tube—a about 14·5 per cent. failed to give the paretic react Of these eight fluids, only three which were exam on several occasions, gave at any time comp precipitation with the Lange reaction.

Table I. gives the readings of a few fluids w were examined several times. Most of the pati from whom the fluids were taken were treated malaria after the first examination of the f It is interesting to note that in this series of cases colloidal reactions were very seldom altered treatment, although the cell count fell rapidl every case, in some almost to within normal li The Lange reaction is given for comparison with B.G. reaction. No relation between clinical impr ment and alteration in the colloidal reactions c be established. Progress seemed to be related r to the number of cells in the fluid, for in those which did not improve after malarial therapy, cell count remained high. It may be of int also to point out that the course of novarsenob which was given to many patients after ma treatment, likewise had no effect on the coll reactions.

TABES DORSALIS.

The results of the test in tabes conformed le one type than those in general paralysis, but a the reaction approximated to that given by the L test. An average reading was 0012321000.

3 cases, three were completely negative. Of these Lange reaction was negative in one case, though Wassermann was positive in cerebro-spinal and blood; in the second, the Lange gave a typical luetic reading, but the Wassermann was negative; whilst in the third, the Lange reading was very low. One case which was diagnosed as a pure tabes, gave the typical paretic reading of 1344444431, with a Lange reading of 5555555554. Later clinical examination revealed mental changes consistent with early paresis. One other case of tabes which gave a paretic response to the B.G. test and complete precipitation in the Lange reaction is still under observation.

TABLE I.

and ment.	Date.	Cells per c.mm.	Total protein.*	Nonne Apelt.	Pandy.	Lange.	B.G. reaction.
.+	12/9/29	3	100	+ +	+ +	4455443210	0133111000
.B.	23/9/29	16	75	+	+	4445321000	0111111100
	30/9/29	6	75	+ +	+ +	3444321000	1443331100
	7/10/29	3	80	+	+	1122100000	1122232100
	21/10/29	5	90	+ +	+ +	0221211000	1221111000
	28/10/29	7·5	75	+ +	+ +	4354543221	0243322111
.+	4/2/30	30	80	+	+	5555544221	3444444442
.B.	25/3/30	1	90	+	+	5555555432	2444443211
	9/4/30	2	60	+	+	5555555543	2444444421
	16/4/30	2·5	75	+ +	+ +	5555555321	4444444311
	29/4/30	3	55	+	+	5555533110	3444444211
.+	18/2/30	220	140	+ +	+ +	5555555432	4444243210
.B.	16/4/30	6	65	+	+	4544442110	3444431100
	29/4/30	9	70	+	+	3433432100	2443443221
	7/5/30	4·5	90	+	+	2433333321	1444432100
	21/5/30	5	80	+	+	5555543200	1222321100
+	25/2/30	25	80	+ +	+ +	5555555555	2444444431
.B.	9/4/30	4	60	+	+	5555555432	1444444221
	16/4/30	2	70	+ +	+ +	5555553200	2444443322
	29/4/30	2	55	+	+	4555332100	1444444421
A.B.	2/9/29	23	70	+ +	+ +	2455555534	1244444210
	23/9/29	17	70	+ +	+ +	4444543210	1232431000
	30/9/29	3	50	+ +	+ +	4445322100	2444444210
	21/10/29	4	55	+	+	3455332100	1234443110
+	19/9/29	135	60	+	+	4445432100	0111221110
B.	27/11/29	2	30	Neg.	Neg.	5555533100	0012211110
	9/12/29	4·5	50	+	+	2223210000	No change.
	6/1/30	8	70	+	+	5333321000	1111111110
+	4/10/29	40	100	+ +	+ +	1555432100	1334443311
p.	26/11/29	4·5	35	+	+	5555543000	1244431110
	9/12/29	8·5	50	+	+	4555554321	2344444311
	6/1/30	6·5	90	+ +	+ +	5555554310	1244443211
+	4/11/29	12	60	+	+	5555452321	x343442110
B.	1/12/29	21	50	+	+	5555543110	1122332100
	9/12/29	4·5	50	+	+	4555554221	1233431110
+	25/10/29	5	—	—	—	0124333211	0001321100
p.	1/12/29	3·5	50	+	+	5544431000	1122321100
	9/12/29	8	55	±	+	2223211000	0011110000
	6/1/30	5	60	+	+	4222210000	1111110000
+	1/12/29	36	75	+	+	555455432x	1344441000
B.	11/2/30	3	40	±	±	4421211000	2424421000
	25/2/30	5	50	+	±	5433332110	1222210000
	4/3/30	2·5	50	±	±	5433333211	0001111000
	25/9/29	17	90	+ +	+ +	5555554332	0144444443
	30/9/29	17	100	+ +	+ +	3555553210	1344444320
	22/10/29	16	150	+ +	+ +	3344433222	3444344432
+	25/11/29	4·5	85	+ +	+ +	3444443332	1111211000
B.	4/12/29	11	50	+	+	0112434332	1111111000
	9/12/29	7	80	+ +	+ +	3443332110	1221221100
lf.+	1/12/29	B.a.	80	+	+	5544443100	x011111110
p.	8/12/29	2·5	60	+	+	2233332211	1332311100
	20/1/30	4·5	70	+	+	2322332100	1321110000
+	6/1/30	9	70	+	+	5554443210	1122311000
p.	13/1/30	96	130	+ +	+ +	4555554210	1244441210
	20/1/30	22	110	+	+	3443442210	1242210000
+	5/3/30	4	45	+	+	5555555421	1344433210
+	19/3/30	3	40	+	+	5555542100	4444443210
	9/4/30	3	60	+	+	5555554100	2444444210
lf.+	1/12/29	12	40	+	+	5555554212	1123331000
p.	27/1/30	9	120	+ +	+ +	5544221100	1344443210
+	7/11/29	10	75	+	+	4444321110	0112321110
+	20/1/30	3	70	+	+	4444333210	1322210000
p.							
+	25/2/30	5	120	+ +	+ +	4554444442	0011222100
.B.	21/5/30	1	50	+	+	1232333211	0121211000
+	5/3/30	52	150	+ +	+ +	5555555555	2444321100
.B.	28/5/30	2	90	+ +	+ +	4544333211	1243431000

* mg. per 100 c.cm.

I. malarial treatment; N.A.B. = novarsenobillon; Tryp. = pe amide; Sulf. = sulfosin. (x in the B.G. reaction indi- es hat as insufficient cerebro-spinal fluid was available, the t be was left empty.) B.a. = Blood admixture.

The duration of symptoms in the cases examined varied from two weeks to 15 years. No case was in the stage of remission so far as could be ascertained. Lumbar puncture was usually done within a week of admittance to hospital, and inquiries as to progress of symptoms after the fluid had been examined invariably elicited the reply that patients felt better since they had been in hospital. The duration of symptoms bore no relation whatsoever to the colloidal reactions of the cerebro-spinal fluid. Whereas the most acute case, with a history of two weeks' diplopia and paraplegia, gave a Lange reaction of 4544443221 and a B.G. reaction of 1323421000, two other acute cases, one of six weeks and one of eight weeks' duration, gave readings of 0111000000 and no change respectively in the Lange reaction and no change in the B.G. reaction. On the other hand, a chronic case of ten years' standing gave a Lange reading of 4555553210 and a B.G. reaction of 1444421000. There was no suggestion of a fresh acute attack in this case.

It was felt that no useful purpose would be served by testing the B.G. reaction on the large number of completely negative fluids from patients with disseminated sclerosis which we examined by the Lange reaction. The total number of fluids we examined from patients with this disease during this investigation was 53. Of these, 27 gave a Lange reaction containing one or more readings of 2, and 19 were tested by the B.G. reaction, there being insufficient fluid available in the other eight cases to carry out the test. Twenty-six cases gave a completely negative Lange reaction. Two of these were tested by the B.G. reaction as controls. Table II. gives our findings in the 21 cases tested. It will be noted that in six cases the reaction is completely negative. It will also be noted that the colloidal reactions are independent of the duration of the disease.

As the examination of the fluids was carried out soon after admission to hospital it is not possible to say what effect treatment may have on the colloidal

CEREBRO-SPINAL SYPHILIS.

Slight precipitation up to the amount expressed by the figure 2 was found in most cases of cerebro-spinal syphilis. Two typical readings were 1112110000 and x001211000. When the Wassermann reaction was negative the B.G. reaction was negative also. With one exception no fluid in this group gave a reading higher than is expressed by a 3. The exception was a case in which the diagnosis may have to be reconsidered.

The patient is a young woman of 28, whose symptoms and signs point either to cerebro-spinal syphilis (there is a suspicious history of two stillbirths), or to disseminated sclerosis. The Wassermann is negative in the cerebro-spinal fluid and blood, whilst the Lange reading is of the paretic type, 5543321000, and the B.G. reaction is 2444442000. On these laboratory findings it seems more probable that the case is one of disseminated sclerosis.

DISSEMINATED SCLEROSIS.

In view of the interest which is being centred on this disease at the present time, we propose to discuss in some detail the results we obtained in the 21 cases which we examined by the B.G. test, and to refer also to the Lange reaction in these cases.

reactions. A single observation is of no value, but as a matter of interest, the patient A. B. (Case 20), whose condition was of long standing, and who had had several courses of arsenic injections, gave one of the strongest readings of the series, both in the Lange and B.G. reaction. The B.G. reaction does not seem to be so sensitive as the Lange reaction in this disease. In only five cases, less than 25 per

TABLE II.

Case.	Duration of symptoms.	Disseminated sclerosis.				Lange.	B.G. reaction.
		Cell count per c.mm.	Total protein.*	Nonne Apelt.	Pandy.		
1	2 w.	41	55	+	+	3544443221	1323421000
2	5 w.	35	55	+	+	4455321000	x133432100
3	6 w.	7	30	−	−	0111000000	No change.
4	8 w.	51	55	−	+	No change.	No change.
5	1 y.	3	45	−	−	1222211000	No change.
6	1 y.	5	90	±	±	0122101000	0111000000
7	1 y., 9 m.	1	25	−	±	2221100000	0121100000
8	2 y.	1	70	+	+	1222332211	No change.
9	2 y.	12	120	+	+	0112221000	No change.
10	2½ y.	8	55	+	+	5555543210	1343321000
11	3 y.	8	45	±	+	3222211000	x112210000
12	3 y.	20	50	+	+	1112232110	0111100000
13	3 y.	5	65	+	+	0123221100	0011110000
14	3½ y.	3·5	200	++	++	0031221100	0110000000
15	4 y.	9	45	+	+	5444432100	3444433322
16	4½ y.	9	90	+	+	4233431000	1122111000
17	4½ y.	6·5	100	+	+	3544232110	1232321000
18	7 y.	None.	45	−	±	No change.	No change.
19	10 y.	—	100	+	+	2455544421	0122100000
20	10 y.	1	50	±	±	4555553210	1444421000
21	15 y.	7	40	−	±	1221000000	x122100000

* In mg. per 100 c.cm.
w. = weeks; m. = months; y. = years.
Abbreviations as in Table I.

cent., was there complete precipitation in any tube, and in only three cases was there a typical paretic response. The proportion of cases giving a paretic response in the Lange reaction was also not very high. In the series of 21, 7, or 33 per cent., showed this reading.

OTHER DISEASES OF THE NERVOUS SYSTEM.

Brief reference must be made to other conditions in which a positive reaction may be given by the B.G. test. These are conditions in which the protein content of the fluid is exceptionally high. In a case of polyneuritis, with a protein content of 1 per cent. and a Lange reaction of 4555422222, the B.G. reaction was 4411000000. Certain cases of spinal compression with a very high total protein gave partial precipitation, the first two or three tubes being completely unchanged, and the precipitation taking place in the fifth and sixth tubes. In other cases only the first or the first two tubes were affected. These curves therefore did not resemble those of tabes or general paralysis. In many other cases with a highly albuminous fluid a completely negative reaction was obtained.

SUMMARY AND CONCLUSIONS.

The cerebro-spinal fluids of 140 patients with diseases of the nervous system have been examined by the bi-coloured guaiac reaction. A Lange colloidal gold test has also been done on each of the fluids for comparison with the new reaction.

Our results justify the statement that the bi-coloured guaiac test is of the same practical value as the Lange test in the laboratory diagnosis of neurosyphilis. The bi-coloured guaiac test runs parallel with the Lange reaction in that certain cases of disseminated sclerosis give positive results. It differs from the Lange reaction in that negative reactions may be obtained in spite of great pro increase.

The ease and certainty with which a good coloured guaiac suspension can be prepared f stock solutions gives the test a definite advant over the Lange reaction, since good colloidal g solutions may be difficult to prepare, and there is satisfactory method of testing them except by t reaction to known specimens of cerebro-spinal fl The Lange reaction is therefore only suited to lab tories where a large number of specimens of cere spinal fluid are examined.

While we have not in this investigation exami the B.G. reaction in relation to the better kn mastic and benzoin reactions, previous experie indicated that the B.G. reaction is more sensitive more easy to read, and agrees more closely in results with the Lange reaction.

The disadvantages of the test are: (1) tha comparatively large quantity, 1 c.cm. of cere spinal fluid, is required for the test; and (2) that not possible to judge what the final reaction wil under 12 hours, whereas with the Lange reactio fair estimate may be made after half an hour. these reasons we do not suggest that this test sh replace the Lange test in the routine examina of the cerebro-spinal fluid. But when diffic arises in the preparation of a good colloidal reagent, the bi-coloured guaiac test may substituted, or may, owing to its more stan nature, be used as a control for the Lange test.

We desire to thank the Medical Staff of the Nat Hospital, Queen-square, for permission to refer t clinical records of cases in the hospital.

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THE ÆTIOLOGY OF CHOLECYSTITI

BACTERIOLOGICAL OBSERVATIONS.

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BEFORE 1892 gall-stones were supposed t produced by simple chemical precipitatio cholesterol as a result of hypercholesterolæmia that year, however, Naunyn showed the impor of infection in the formation of stones, and adva his theory of a "lithogenous catarrh" of the bladder. Since then, the importance of infecti gall-stone formation has been generally admitted Moynihan has picturesquely described how a gall- may be a tombstone erected to the memory organism still living inside.

Earlier investigations were directed rather tov the occurrence of organisms in the bile, and mer of the coliform group were the chief ones isol Owing to the prevalence of typhoid fever at th of the last century, much attention was pa typhoid cholecystitis. More recently, the orga of the enteric group have been encountered less frequently in this condition. As will be below, *Bacillus paratyphosus* B was isolated once in the present series of 106 cases.

Rosenow,[1] in 1916, was the first to stress the importance of the streptococci, and also the need for examining the wall of the gall-bladder in order to obtain an adequate idea of the organisms present. In a series of 47 cases he demonstrated the presence of streptococci, either alone or in combination, in 76 per cent. of cases in which the wall was examined. *B. coli* and other organisms occurred less frequently. He found that these organisms had a very marked tendency to localise electively in the gall-bladder of experimental animals. Thus in 53 animals, the gall-bladder was attacked in 79 per cent. of cases, and other organs much less frequently. These results were obtained with freshly isolated strains, and as the result of inoculating considerable quantities of culture. A. L. Wilkie [2] has recently claimed similar results. In 50 cases he isolated streptococci from the cystic gland in 86 per cent., and from the gall-bladder wall in 42 per cent. The bile, on the other hand, was generally sterile. He considered that the streptococci were susceptible to the action of bile, and found that they had considerable affinity for the gall-bladder of rabbits, invariably producing a progressive chronic cholecystitis.

The present work was undertaken with the object of investigating the occurrence of streptococci in cholecystitis and their biological characters, and also their power of attacking the gall-bladder of animals on intravenous injection. Attention has been directed towards cholecystitis rather than cholelithiasis. It is impossible, however, in any experimental work to dissociate the two conditions. Undoubtedly either condition may occur without the other, and either may predispose to the other. In the great majority of cases dealt with clinically, however, we find that the two conditions coexist, although of recent years there has been a tendency to operate on earlier cases, especially since the introduction of cholecystography.

Technique of Present Investigation.

Material from 106 cases of cholecystitis had been examined. The following technique was observed when specimens were taken at operation.

After removal of the gall-bladder the cystic gland, when palpable, was dissected off and placed in a sterile test-tube. The clamp on the cystic duct was then replaced by a ligature in order to prevent escape of bile, and the gall-bladder was removed to the laboratory in a covered sterile dish or sterile swabs. In most cases cultures have been made from the specimens immediately after removal from the theatre; on a few occasions an interval of three or four hours elapsed. Other cases where the interval was longer have been excluded from consideration.

In the laboratory the cystic gland was first cultured. With due precautions it was transferred to a covered sterile mortar, minced up with sterile scissors, and emulsified in broth with a pestle. Tubes of warm glucose broth and, in some cases, blood-agar plates, were then inoculated with the emulsion. Cultures were incubated for at least seven days or until growth occurred.

Cultures were also made from the gall-bladder wall. The peritoneum and the layer of subperitoneal fat, which is usually present in chronically diseased gall-bladders, were reflected with sterile instruments and the so-called "sub-mucous" coat exposed. Strips of this were dissected away, without opening the lumen of the gall-bladder, and cultured in the same way as the cystic gland. The lumen of the gall-bladder was next opened, and cultures made from the bile or other contents or from the surface of the mucous membrane or stones.

In cases in which the wall was only slightly thickened—and there were many of this nature in the series—it was not found possible to obtain an adequate amount of the sub-mucous layer for culture without opening the lumen of the gall-bladder, and in these circumstances fragments of the whole thickness of the wall were used. In order to kill any organisms present on the surface of the tissue in the bile, several of the fragments were cultured after being washed with sterile saline, or after momentary exposure to boiling water or brief immersion in spirit followed by washing with saline.

Cultures were made from gall-stones after the surface had been sterilised by immersion in spirit and flaming. If large, the stones were cut with a sterile knife and the centre scooped out and emulsified. If small, the complete stone was emulsified.

The media employed were glucose broth, phosphate broth, glucose agar in deep tubes, and rabbit blood-agar plates. Glucose brain broth was used in some cases. Rosenow has stressed the importance of fluid media for supplying all grades of oxygen tension. Primary broth cultures were purified by plating out on a blood-agar plate. In a few cases organisms resembling *B. subtilis* and unidentified cocci of the nature of sarcinæ have been obtained. These have been regarded as contaminants.

Classification and Findings.

The classification of the gall-bladders examined has presented some difficulty, owing to the enormous variation in the pathological changes present. Most classifications of cholecystitis seem to be needlessly complicated, and we have adopted the simple but convenient divisions of acute cholecystitis, chronic cholecystitis with or without stones, and cholesterosis.

ACUTE CHOLECYSTITIS.

The four cases grouped under the heading of acute cholecystitis derive their place rather from clinical reasons. All were admitted as emergency cases, three being operated on at once and the fourth within a few days. Two of the patients subsequently died. Gross inflammation was present in all, the gall-bladder in two cases being gangrenous. Stones were removed in three cases.

TABLE I.—*Acute Cholecystitis.* (*Four Cases.*)

Case.	Diagnosis.	Gall-bladder wall.	Contents.
1	Acute cholecystitis with stones.	*B. welchii.*	*B. coli.*
2	Gangrenous cholecystitis with stones.	No growth.	*B. coli.* Enterococcus. *B. welchii.*
3	Acute cholecystitis, gall-bladder being partly gangrenous.	*B. welchii.*	*B. coli.*
4	Gangrenous cholecystitis with stones.	*B. coli.*	,,

The bacteriological findings in each case are shown in Table I. It will be noted that *B. coli* occurred in every case and *B. welchii* in two cases.

CHRONIC CHOLECYSTITIS.

The second group comprises the great majority of cases. In gross pathology the specimens showed great variation, all degrees of inflammation being represented. Several cases of empyema or mucocele

TABLE II.—*Chronic Cholecystitis With or Without Stones.* (*93 Cases.*)

Cases	Gland. 43	Wall. 84	Contents. 81	Stones. 41
Streptococcus	7	10	15	2
,, plus *B. coli* ..	1	4	6	—
B. coli	6	15	10	5
Diphtheroid bacilli ..	4	4	1	—
B. welchii	1	3	1	—
Staphylococcus aureus ..	1	2	1	—
Staphylococcus albus ..	4	8	4	2
B. paratyphosus B. ..	—	—	1	—
No growth	19	41	43	31
				B. py. 1.

B. py. = *B. pyocyaneus.*

and a number of cases of stone in the common bile-duct have been included. Many specimens showed evidence of recent inflammation. Stones were present in 72 out of the 93 cases. The results of the cultures are shown in Table II.

CYSTIC GLAND.

The cystic gland, which varied in size from that of a pinhead to a small bean, was examined in 43 cases. In some cases, in which it could not be identified with certainty, the connective tissue from the neck of the gall-bladder was cultured, but as this was never found to give a growth unless contaminated with bile these cases have not been included in the Tables. On several occasions the tissue was removed from the culture tube at periods varying between three and seven hours, on the supposition that there might be some substance in the tissue which inhibited bacterial growth. There was no difference in result, however, between these tubes and others in which the tissue was allowed to remain.

It will be seen from Table II. that streptococci were obtained in eight cases (19 per cent.) and *B. coli* in seven cases (16 per cent.) in which the cystic gland was cultured. It is impossible to exclude contamination of the gland by bile in some cases in which the same organism was obtained from both gland and bile, owing to the exposed position of the gland when the duct is divided. Thus, on four occasions on which a streptococcus was cultivated from the cystic gland a similar organism was also obtained from the bile.

GALL-BLADDER WALL.

The gall-bladder wall was examined in 84 cases, and the presence of streptococci, either alone or in combination with *B. coli*, was demonstrated on 14 occasions (17 per cent.), *B. coli* was isolated in 19 cases (23 per cent.). On seven occasions a streptococcus similar to that found in the wall was obtained from the bile. In three further cases a similar organism was found in gland, wall and bile, and in one other case in the gland and bile. Of the 24 cases in this group in which streptococci were found, in only five were they not found in the bile. In one of these the bile was not examined. In three others streptococci were found, either alone or in combination with *B. coli* in the wall, while *B. coli* was found in the bile. In the tabulation of the results an organism has been considered to be an intramural one if it has been obtained either from the outer coats or from the whole thickness of the wall, when the bile has given no growth, or after sterilisation by one of the methods described above.

The results of the cultures have often been surprising. Occasionally naked-eye appearances are extremely deceptive. It may be stated on the whole, however, as noted by Illingworth,[3] that the specimens most likely to give a growth are those with a thick and œdematous wall.

CONTENTS.

The bile, mucus, pus, or other contents of the gall-bladder or the surface of stones have been examined in 81 cases of chronic cholecystitis, and the results are shown in Table II. Here, again, as noted by Illingworth, naked-eye appearances are very deceptive. A purulent-looking content may be sterile, while thin bile may yield a growth. The important factor, however, seems to be the concentration of the bile. It has been found that thick, tarry bile, so often looked upon with suspicion, is always sterile, whereas white bile is nearly always infected.

Streptococci were isolated from the contents in 21 cases (26 per cent.), in six of which they were associated with *B. coli*. *B. coli* was present in 16 specimens (20 per cent.); two of the coliform strains appeared to be identical with *B. lactis aerogenes*. It is of interest to note that a streptococcus was only isolated once out of the 21 cases in this group in which stones were absent, and in that case it was isolated fro the bile. In one other case in which stones we absent, *B. paratyphosus* B was obtained from t discharge from a gall-bladder sinus. This patie had several months previously suffered from par typhoid fever, and had subsequently developed acu cholecystitis, for which drainage of the gall-bladd was carried out.

CHOLESTEROSIS.

Nine cases of this condition were investigated an the results are shown in Table III. Only those cas showing a general "strawberry" appearance the whole mucous membrane are included under th heading. Stones were present in six cases, two of the being single cholesterin stones.

TABLE III.—*Cholesterosis.* (*Nine Cases.*)

Cases ..	Cystic gland 4	Wall. 8	Contents. 8	Stones 3
Streptococcus ..	—	1	1	—
B. coli	—	1	—	—
Staphylococcus aureus	—	1	—	—
Staphylococcus albus	—	1	—	1
No growth ..	4	4	7	2

The low incidence of organisms in this condition which is in accordance with the recent findings Illingworth [4] and Nickel and Judd,[5] is of interes when we consider that inflammatory changes some degree are nearly always present. Thus i 35 cases of Illingworth's inflammatory changes we only once absent.

Nature of the Organisms Isolated.

The classification of streptococci into hæmolytic an non-hæmolytic types is now generally accepted, an all the organisms under consideration fall into th latter type. A few of them produced tiny zones hæmolysis on blood-agar, but none of them showe true "beta" hæmolysis. It is possible to a certai extent to tell from the general characters of a no hæmolytic streptococcus its probable natural locatio in the body.

Of the eight strains isolated from the cystic glan four corresponded definitely to enterococci in the characters of heat-resistance, tolerance of a mediu containing bile, and ability to split æsculin. Th other four resembled salivary streptococci. Of t strains obtained from the gall-bladder wall seven we enterococcal in type, and of 23 strains cultivated fro the bile, nine belonged to this group. Of the remainin strains, some resembled salivary types while the re were of the nature of *gamma* streptococci. Thomso and Thomson [6] have recently emphasised the valu of Warren Crowe's medium in differentiating strepto cocci. A systematic study of all strains has not bee carried out on this medium, but a certain numbe have been tested and have been found to present variety of colony appearances. This result is i agreement with the other evidence regarding th biological diversity of our streptococci.

A serological examination of the strains isolate showed that there was considerable antigenic hetero geneity. Agglutinating antisera were prepared b immunising rabbits with three strains of *Streptococcu viridans* previously isolated from the cystic glan Two of these strains were serologically identical, an were quite distinct from the third strain. Agglutina tion and agglutinin-absorption tests were carried ou according to the technique described by McLachla and Mackie.[7] These tests indicated that one of th

trains examined was related antigenically to two of he cystic gland strains, but was not identical with hem, as it did not completely remove the agglutinin rom the sera. A second strain likewise showed a artial antigenic similarity to the third cystic gland train. The remainder of the viridans strains and all he enterococci which were tested did not react with hese sera. Agglutinating sera were prepared for wo strains of enterococcus, which were themselves erologically distinct as judged by agglutinin-bsorption tests. None of the enterococci or other treptococci which we studied reacted in a significant nanner with these sera.

Of the other organisms isolated, *B. coli* has occurred nost frequently and occupied the most important lace. With few exceptions, it has shown the bio-ogical characters of "typical *B. coli*." In two cases f cholecystitis, *B. lactis aerogenes* was isolated, and n a third case a non-lactose-fermenting variety of *3. coli* was obtained. The occurrence of *B. welchii* s of considerable interest in view of recent work on he use of *B. welchii* serum in acute abdominal onditions. It seems to have been first described in holecystitis by Gilbert and Lipmann [8] in 1904, and as since been found by numerous observers. In he present work it was found in six cases: in the land once, in the gall-bladder wall five times, and n the contents twice.

Animal Experiments.

In order to test the power of the organisms isolated o localise electively in the gall-bladder of experimental nimals, a number of intravenous injections in rabbits rere given. The organisms used were streptococci, *3. coli*, *B. paratyphosus* B, and *Staphylococcus aureus*. he strains tested were injected as soon as possible fter isolation.

Twenty-four-hour broth cultures were employed, and the njection given into the ear vein. Two methods of dministering the organism were practised. In the first nall doses of 300 to 500 million organisms were given t weekly intervals, as advocated by A. L. Wilkie. Up o nine injections were given. In the second method, a ngle large dose of 5000 to 10,000 million organisms was iven, and the animal was killed in a few days if the injection id not prove fatal. This is the method practised by Rosenow. The enormous doses originally employed by Rosenow, such as the deposit from 45 c.cm. of a broth culture, rere not used. Rosenow has stated (1928) [9] that in his iore recent work on elective localisation he has only mployed one-tenth to one-fifth of the quantities formerly njected.

When the injection did not prove fatal the animals were illed by chloroform at periods varying from a week or two p to several months. All the viscera were carefully xamined at once, together with several joints, and usually lso the brain. Cultures were made from the heart blood, ile, gall-bladder wall and joints, and from any organ howing a lesion.

The appearance of the healthy rabbit's gall-bladder was etermined from a number of examinations carried out on nimals killed for other purposes. It is a very delicate ructure, bluish in colour, and with a translucent wall. t can be moved freely in a sideways direction. The bile of variable colour, but is thin and free from granules.

Thirty-one rabbits received injections of strepto-occi by one of the two methods described above. Twelve were injected with strains derived from the ystic gland, seven with gall-bladder wall strains, leven with bile strains, and one with a streptococcus erived from a gall-stone. After the injection of these rganisms, a gross lesion of the gall-bladder developed n only one rabbit, and there was a doubtful lesion in nother animal.

In the first case the animal was inoculated with 7 c.cm. f a broth culture of a poorly growing viridans streptococcus olated from the bile and gall-bladder wall of a case of hronic cholecystitis. The animal remained apparently ell and was killed after a week. The gall-bladder was found to be thick and œdematous, and covered with fibrin. A streptococcus with the same biological characters as the strain injected was recovered from the wall. Microscopic examination of sections of the gall-bladder wall showed considerable œdema of the tissue and infiltration by large numbers of polymorphonuclear leucocytes. The epithelium had desquamated, and streptococci were found in the wall after prolonged search. Intravenous injections of the organism recovered from the gall-bladder did not produce cholecystitis in other rabbits.

In the other case in which a slight lesion of the gall-bladder was found, the animal had been injected two days previously with 7 c.cm. of a broth culture of *S. viridans* isolated from a cystic gland. The gall-bladder wall was found to be slightly œdematous, but cultures from it and also from the bile were negative.

Lesions in other organs were sometimes encountered. Thus, hæmorrhages in the stomach were found with great frequency, and in one case large vegetations were produced on the aortic valves. In no case was arthritis noted.

B. coli.—Six strains of *B. coli* were injected intra venously in different rabbits, the organisms having been isolated from the bile of patients with chronic cholecystitis in three cases, from the gall-bladder wall in two cases, and post mortem from the heart blood of one of the rabbits in one case. In one animal a gross lesion of the gall-bladder was found. The animal died two days after the injection. The gall-bladder wall was thickened, and the bile was turbid and filled with numerous tiny yellow granules, together with several black granules. *B. coli* was isolated from the bile.

B. paratyphosus B.—Three rabbits received intravenous injections of this organism. Two animals were inoculated with the strain isolated from the discharge from a gall-bladder sinus, and died after two and three days respectively. In both there were pneumonia and general congestion of the organs, and in one the gall-bladder was acutely inflamed and contained several small granules. *B. paratyphosus* B was recovered from the bile of both rabbits. The third rabbit was injected with a strain which had been isolated from sewage, and died three weeks after the injection. At autopsy the gall-bladder was whitish and thick and full of soft brownish concretions. *B. paratyphosus* B was recovered from the bile and gall-bladder wall.

Staphylococcus aureus.—Intravenous injections of this organism did not lead to cholecystitis.

DIRECT ATTACK ON THE GALL-BLADDER.

As intravenous injections of streptococci appeared to be followed in only a small proportion of cases by a definite cholecystitis, attempts were made to determine the localisation and multiplication of organisms in the gall-bladder by traumatising the viscus and inoculating cultures intravenously. The effect of trauma by itself was controlled. In carrying out this procedure a laparotomy was performed under ether anæsthesia, and the gall-bladder was gently rubbed and squeezed with the finger. Immediately after the operation an intravenous injection of streptococci was given, and repeated once or twice. The strains used had been isolated from the cystic gland, from the bile, and from the mouth of a healthy person. This procedure was carried out in four rabbits; in none of these was there any pronounced change in the naked-eye appearance of the gall-bladders. Trauma without injection was carried out in five rabbits. In two of these the gall-bladder was traumatised once, and in one the gall-bladder showed no change after an interval of two months. In the other the animal died after 19 days, and at autopsy the gall-bladder was found to be thickened and full of purulent material, from which *B. coli* was isolated.

In two other animals the gall-bladder was traumatised twice with an interval of three weeks between each operation and the animals were killed after two months. In both there was definite thickening of the gall-bladder wall. In the fifth rabbit the gall-bladder was traumatised four times at weekly intervals. The animal was killed two months after the first operation, and the gall-bladder wall was found to be thickened and surrounded by adhesions, with its lumen full of inspissated material.

The effect of injecting streptococci into the wall of the gall-bladder was also investigated. A very fine needle was used for this purpose. It was found necessary to give very small doses, as in some cases leakage of the suspension into the peritoneal cavity occurred, with subsequent peritonitis and death. This procedure was carried out in three rabbits and resulted in a slight thickening of the gall-bladder wall. A similar condition was also observed in two control animals in which sterile saline was used instead of the suspension of organisms.

Summary.

The bacteriological and experimental work detailed bove was originally undertaken with the object of investigating the rôle of streptococci in inflammatory disease of the gall-bladder, and also their power of "elective localisation," or, in other words, their selective affinity for the gall-bladder tissue of animals. As the work proceeded, streptococci were found in only a small percentage of cases, as contrasted with the incidence reported by certain other workers. Thus out of 106 cases examined, streptococci were found in 26 cases, and *B. coli* in 28 cases. Certain other facts that were in disagreement with some recent ideas on the ætiology of cholecystitis also became apparent. Thus, out of the 26 cases in the series in which streptococci were found, they were present in the bile in 21 cases. In one of the other five cases the bile was not examined; in three of them streptococci were found either alone or in combination with *B. coli* in the gall-bladder wall, whereas *B. coli* alone was found in the bile. It is thus possible that in these cases streptococci were present in the bile but were outgrown by *B. coli* in culture. In the remaining case, streptococci were found in the cystic gland, while the gall-bladder wall and bile were sterile. The high incidence of infection of the bile with streptococci is thus very striking in those cases in which this organism was present, and remains so, even if we exclude the cases of acute cholecystitis and of calculus in the common bile-duct, in which the bile is almost invariably infected. It must also be realised that any contamination of the cystic gland or outer coats of the gall-bladder wall by bile in the course of operation must increase the number of cases in which these structures are apparently infected. In our experience bile has not been inhibitory to the growth of the majority of the types of non-hæmolytic streptococci which we have encountered in these conditions; this is in accordance with the recent work of Nickel and Judd, and contrary to the findings of A. L. Wilkie.

It was also noted that a large percentage of the streptococci isolated were undoubtedly of the "enterococcus" type, which is found naturally in the bowel. The others belonged to types which are known to occur both in the mouth and in the bowel. In several cases undoubted enterococci were isolated from the cystic gland and from the gall-bladder wall. In each case also in which streptococci occurred in more than one site the strains isolated were found to have similar characters, this being in disagreement with the findings of Wilkie, who described cultural differences between the streptococci isolated fro the cystic gland and the bile in the same case. was also found in some cases that mixtures streptococci and *B. coli*, both growing freely, we obtained from various situations.

All these facts seem to indicate that the origin site of the streptococci isolated was the same as th of *B. coli* (i.e., the bowel) and that, therefore, t route of infection to the gall-bladder was presumab the same. There would seem to be no evidence th the streptococcus is the primary invader and *B. coli* t secondary invader. The part played by both in t invasion of the gall-bladder seems to be simil We do not feel justified in concluding from our wo however, that any of the organisms we have isolat is the primary factor in the production of infla matory changes in the gall-bladder. It is conceivab that they may all play merely the rôle of seconda invaders when once some pathological change, to or biochemical, has already commenced in the ga bladder.

Further experiments are in progress with the obj of determining the route by which organisms rea the gall-bladder. So far, however, our anim experiments have not supported the idea th organisms usually reach the gall-bladder by means f the systemic circulation, nor have we been able sustain the theory that the organisms isolated in t condition have the power of localising electively the gall-bladder of animals on intravenous injecti It has been already noted that out of 31 rabb injected intravenously with streptococci, only t showed a gross lesion of the gall-bladder. Any acti of these organisms on the gall-bladder, therefo appears to be purely a chance one, and entir non-specific.

Few theories in medical science have been so mu debated as that of "elective localisation." On t whole, Rosenow's results have not been genera confirmed. Holman[10] has recently made a ve critical analysis of Rosenow's figures. He has sho that there is very little difference in the percenta of lesions produced in various organs with spec and with non-specific strains, and that indeed many cases the percentage is higher with the n specific than with the specific strains. Gay however, has also analysed Rosenow's figures, w the opposite result. He finds that among 8 animals injected with 220 strains, gall-bladder lesi were produced in 80 per cent. of cases with spec strains, and only in 11 per cent. with non-spec strains.

It would be absurd to criticise the whole theory f elective localisation on the basis of the work descri in this paper, but, at any rate as regards the g bladder, we have not been able to support it.

Conclusions.

1. Material from 106 cases of cholecystitis h been examined. Streptococci have been found the cystic gland or gall-bladder wall in 16 per cent. these and *B. coli* in 20 per cent. Streptococci ha been found in the contents in 20 per cent. and *B. coli* 19 per cent. 2. The streptococci isolated have b largely of the type which occur normally in bowel. 3. No evidence has been obtained th *B. coli* is merely a secondary invader, and that streptococci are the primary invaders. The rôle both, whether they be primary or secondary invad seems to be similar. 4. The organisms isolated ha very little power of localising electively in the g bladder of experimental animals.

We should like to express our thanks to Prof. Mac

for his constant help and guidance throughout this work. We should also like to thank Prof. D. P. D. Wilkie, who has been at considerable pains to provide us with the greater part of the material used, and who has given us much other assistance and encouragement. Mr. Henry Wade, Mr. J. W. Struthers, Mr. J. M. Graham, and Dr. W. R. Martine have also kindly provided us with material. Mr. C. F. W. Illingworth has given us much useful advice.

The work has been done during the tenure of a Vans Dunlop scholarship by one of us (B. W.). Part of the expenses have been paid by a grant from the Moray Fund.

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THE PYROGENETIC ACTION OF SULPHUR IN OLIVE OIL.

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Schroeder [1] and Harris [2] have reported on the use of sulphur in olive oil as an agent for the treatment of general paralysis and other psychoses, and point out that pyrexia follows its administration. I have used a preparation of sulphur in olive oil ("Colsul") made by the Crookes Laboratories, and have noted its effect in producing pyrexia. No claim is made here that this preparation is a panacea which will cure these disorders.

Control injections of collosol sulphur in water (0·1 per cent. sulphur), collosol calcium, and sterile olive oil, all prepared by the Crookes Laboratories, did not cause a rise of temperature.

METHOD OF TREATMENT.

The technique adopted is similar to that used by Schroeder and Harris. The injections are given intramuscularly into the outer side of the thigh in the morning. The temperatures are recorded every two hours for the first eight hours, and then every 30 minutes for the next two hours, and then at 15-minute intervals until the acme is reached. When this has occurred the temperature is taken every 30 minutes and then every two hours until it is normal again.

The colsul used has been supplied in 5 c.cm. phials. It is warmed before injection. The first dose is half a c.cm., and the doses are increased by half a c.cm. every alternate day for a course of ten injections, the largest dose thus being 5 c.cm. These doses are smaller than those used by the previous reporters but produce similar pyrexial reactions. A second series of injections has been given within three weeks of the completion of the first, the interval allowing time for various investigations to be made on the effect of the treatment.

[1] Schroeder, Knud: THE LANCET, 1929, ii., 1081.
[2] Harris, N. G. Ibid., 1930, i., 1068.

EFFECT OF THE INJECTIONS.

Eighteen cases have so far been treated, nine of general paralysis and nine of non-syphilitic functional mental disorder. Although the doses have been smaller there has been much more local discomfort than Schroeder claims to have noted, but this gradually passed off in the course of a few days. As a rule the temperature rises gradually, reaches its maximum in about 12 hours, and returns to normal in periods varying from 12 to 72 hours. In one case it continued over a period of five days from the initial injection, but usually it is normal within 24 hours. The temperature charts seem to show that, with the increase of dose, there is a corresponding increase of pyrexia, but this is not constant even with the same type of mental disorder, probably because of the individual peculiarities of the response of thermogenic centres. The duration of the pyrexial period depends also on the individual. The highest temperature recorded in this series of cases was 105·4°, this being at the ninth injection of 4·5 c.cm., but most of the cases gave maximum pyrexias of about 104°. In this therapy, as has also been noted with T.A.B. vaccine given intravenously, there may be secondary rises of temperature following what appears to be the fall from the acme induced by the agent itself, and these have been observed in the majority of the charts. These secondary rises delay the fall of temperature and are more in evidence when the temperatures are higher.

The extent of the pyrexial swing from subnormal or normal level at the time of injection was also found to vary with corresponding injections in different patients. The maximum alteration of temperature noted has been 7·8°, and occurred in a case at the end of a course following the injection of 5 c.cm.

The valuable property of the preparation is the comparatively small disturbance of the circulation which is associated with such elevations of temperature. In no case has a pulse-rate above 120 per minute been recorded, and nearly always the respiration ratio is approximately normal; for example, a patient after an injection of 1 c.cm. gave a maximum temperature of 104·2°, a pulse-rate of 94, and a respiration-rate of 24. Little deleterious effect on the peripheral circulation has been noted, pallor and cyanosis having rarely been seen.

In seven cases definite rigors have been noted, occurring from 30 minutes to 4 hours before the maximum temperature. These are minor compared with those induced by malaria or T.A.B. vaccine (given intravenously). Most of the cases had had treatment for dental sepsis and nasal sinus infection before the injections. In two cases focal reactions occurred in areas of sepsis for some days after injection—e.g., antra of Highmore which had previously given clear returns on irrigation again became mucopurulent. In one case—a general paralytic—definite herpetic vesicles appeared on the hands after the third injection. This patient had already had T.A.B. vaccine and malarial pyretotherapy. No bowel disturbance has been noted and vomiting—and even that mild—in only one case. Profuse sweating has been present in all the cases, the extent depending on the pyrexia induced.

ADVANTAGES.

No patient has been made worse, either mentally or physically. Abscesses have not appeared at the site of injection. Good pyrexial reactions follow, but their extent may be dependent on the patient, apparently on the activity of the thermogenic centre. Thus, one patient regularly had pyrexias of 105°

with malaria and gave the same response to colsul. Another, however, regularly gave poor pyrexias with malaria but much better with colsul. The pyrexias follow the injection, and there is no delay due to an incubation period. No additional disease is induced, nor are agents required to control it. Therefore a febrile state can be induced at any time of the year and the pyrexias can be timed as desired, and produced by intramuscular injection. The agent seems to cause a focal reaction in the areas of chronic sepsis. This latter reaction indicates its value and probable mode of action in the treatment of mental disorder.

My thanks are due to my medical superintendent, Dr. T. C. Graves, and to Mr. J. F. Ward, of British Colloids, Ltd., for help received and for the preparation of the material for control injection.

SULFOSIN THERAPY IN GENERAL PARALYSIS OF THE INSANE.

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AND

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IN 19 cases of general paralysis of the insane we have administered sulfosin Leo—a 1 per cent. suspension of sulphur in olive oil—according to the method originated by Schroeder.[1] We employed this method without modification, and adopted the graduated dosage, beginning at 1 c.cm. and increasing by 1 c.cm. each time to a maximum of 10 c.cm.; in two of our patients the course was stopped at the seventh and the eighth injection respectively owing to increasing debility. We can record no such dramatic results as would justify the publication of full clinical records of cases observed for a maximum of only six months. But it seems desirable to record certain of our findings. We begin by tabulating the average maximum temperatures obtained in each case during the courses of sulfosin.

Case.		Case.	
1	102° F.	14	1st course, 101·9° F.; 2nd „ 100·6° F.
2	101·3° F.		
3	102·3° F.	15	1st „ 101·6° F.; 2nd „ 100·5° F.; 3rd „ 101° F.
4	101·8° F.		
5	101·7° F.		
6	104° F.	16	1st „ 101·2° F.; 2nd „ 100·7° F.
7	102·5° F.		
8	1st course, 101·6° F.; 2nd „ 101·7° F.	17	1st „ 102° F.; 2nd „ 100·9° F.
9	102·2° F.	18	1st „ 101·7° F.; 2nd „ 100·9° F.
10	101·7° F.		
11	100·8° F.	19	1st „ 102·1° F.; 2nd „ 100·5° F.
12	102·2° F.		
13	102° F.		

Serological tests were made at the Maudsley Hospital, and the results of the Wassermann reactions are given in five increasing strengths as follows:—Blood: +6, +7·5, +10, +15, and +30. Cerebro-spinal fluid: +2, +3, +6, +15, and +30.

On the whole the following table shows little serological change immediately after sulfosin therapy in 19 cases, of whom 13 had a single course, 5 two courses, and 1 three courses. Schroeder, despite his general dictum that the serological changes may not become manifest until a considerable time after the course of sulfosin, gives details of case after case in which very marked serological changes developed during, or apparently immediately after, a single course of sulfosin. He also describes most rapid and dramati clinical results in the majority of his patients. Ou results, both clinical and serological, are comparativ failures.

B.W. = blood Wassermann. C.S.F.W. = cerebro-spinal flu Wassermann. C.S.F.L. = cerebro-spinal fluid Lange. S. = cour of sulfosin. S+s+b = course of sulfosin synchronous wi course of sulfarsenol and bismuth. — = Not done.

Case.	—	B.W.	C.S.F.W.	C.S.F.L.	Previous treatment.
1	Before S.	+30	+30	5555432100	Nil.
	After S.	+30	+30	5554321100	
2	Before S.	Neg.	+ 6	4443310000	Nil.
	After S.	+30	+ 3	3332210000	
3	Before S.	+30	+30	5555543210	Nil.
	After S.	+10	+ 6	5543210000	
4	Before S.	+30	+ 6	4322110000	Course of bismu
	After S.	+15	+ 3	Neg.	
5	Before S.	+30	+30	5555432100	Course of sulfa
	After S.	+15	+ 6	55443210000	senol and bismut
6	Before S.	+30	+ 6	5554432100	Induced malari
	After S.	+ 7·5	+15	5543211000	
7	Before S.	+30	+30	5554320000	Induced malari
	After S.	+30	+15	4433210000	
8	Before S.	+30	+15	3332210000	Induced malar
	After S.	+30	+ 6	Neg.	
	After 2nd S	+10	+15	Neg.	
9	Before S.	—	Neg.	5544321000	Induced malari
	After S.	+15	+ 6	5555432100	course of sulfa senol and bismu
10	Before S.	+15	+30	555543210	Induced malari
	After S.	—	+30	5544321000	course of sulfa senol and bismu
11	Before S.	—	+30	5544321000	Induced malari
	After S.	+30	+30	5555432110	course of sulfa senol and bismu
12	Before S.	—	+15	5555543210	Induced malari
	After S.	+30	+15	55543211000	course of sulfa senol and bismu second course bismuth.
13	Before S.	—	+ 6	5555321000	Induced malari
	After S.	+ 7·5	+15	5544321000	course of sulfa senol and bismu second course bismuth.
14	Before S.	+30	+30	5555555421	Nil.
	After S+s+b.	+30	+30	5555543210	
	After 2nd S	+30	+30	0122322100	
15	Before S.	Neg.	+15	3345543210	Nil.
	After S+s+b.	—	+15	5554432100	
	After 2nd S	+15	+15	4432100000	
	After 3rd S	Doubtful.	+15	2221100000	
16	Before S.	+30	+30	5555554321	Nil.
	After S+s+b.	+15	+15	5555432100	
	After 2nd S	+30	+30	5555544321	
17	Before S.	+15	+15	5555543210	Antiluetic, deta not known.
	After S+s+b.	+15	+ 3	4432110000	
	After 2nd S	+ 6	+ 3	4433211000	
18	Before S.	+30	+ 6	5554432100	Induced malar
	After S+s+b.	+15	+ 6	4432100000	
	After 2nd S	+10	+ 3	5443210000	
19	Before S.	—	+15	5555543210	Induced malari
	After S+s+b.	—	+ 6	5554310000	course of sulfa senol; course tryparsamide
	After 2nd S	+30	+30	5554432100	

The justification of this early report is that consider all weak links in sulfosin therapy, the val of which is still sub judice, should be detected a eliminated as soon as possible; and our main purp is to point out a possible weak link. Schroede paper gives the impression that the typical pyrex in his cases after each dose of sulfosin was 104° or 105° F.

"It is important to know the maximal temperatu

[1] Schroeder, K.: THE LANCET, 1929, ii., 1081.

ained, as the dosage of the injections is dependant on s, since the aim is a rise of temperature to about 104° F. more. One begins with a small test dose (1 c.cm.) and reases the dose by 1 c.cm. up to 10 c.cm., as the nperature will increase with the increase of the se. The next injection is given when the temperature s fallen to normal—usually after 24 hours—so the ection is given about twice a week."

In our series, however, the typical pyrexia was not 4° or more, but 101° or 102° F.; pyrexias of 105° d 104° did occur, but only once and ten times spectively in about 250 injections; moreover, Case 6, in his single course of sulfosin, provided e 105° pyrexia and six of the 104° pyrexias, the portion of high temperatures in the other 18 tients was even lower than the first figures imply. hatever the value of sulfosin may be in general paralysis, it is conceivable that this value depends on the height of the pyrexia produced by each dose; we therefore suggest, as Schroeder himself has proposed already, that in sulfosin therapy one should aim at securing in each patient consecutive pyrexias of 104° or 105° F., such as occur in induced malaria. Our experience is that the recommended ten-dose course of sulfosin, beginning at 1 c.cm. and increasing 1 c.cm. at a time to 10 c.cm., fails to produce such pyrexias, not in the isolated atypical case but in the great majority of cases.

We wish to thank Dr. G. F. Barham, medical superintendent of Claybury Mental Hospital, for permission to carry out and publish this research, and we also acknowledge our great indebtedness to the staff of the Maudsley Hospital laboratory, where the numerous serological examinations were performed.

CLINICAL AND LABORATORY NOTES

A CASE OF PITUITARY CACHEXIA.

By Jane W. Stocks, M.B. Glasg.,

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The following case is of interest for the extreme ntal apathy and muscular atonia which are probably erable to a disordered pituitary gland. Such ndromes are, in varying degrees, common in mental spitals. The association with pituitary disturbance substantiated by its resemblance to published ses of pituitary cachexia (one of which had an scess separating the anterior lobe of the pituitary nd from the posterior lobe). The Joint Board Research for Mental Diseases, Birmingham, ve found post mortem, large masses of colloid the pars intermedia of the pituitary in many ses of mental disorder.

THE CASE RELATED.

The patient, a single woman, aged 33, was mitted on Jan. 18th, 1928. She had had several tacks of influenza before an operation in May, 1919, removal of a cystic diseased ovary; after this eration she had been almost continuously in bed til her admission here. She was stated to be ffering from "neuritis and neurasthenia" during at period and had psycho-therapeutic treatment. February, 1927, she had two attacks of influenza d in April, 1927, her father was accidentally led. From then on there appeared to be an acerbation of the symptoms, her condition became ogressively worse, she became very emaciated, fused her food, and said she wanted to die.

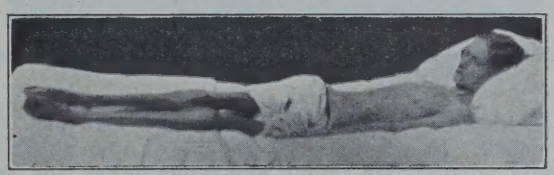
There was no case of psychosis in the family story. The patient had been at school until the e of 14, reaching standard VII., and had subsetently worked in a factory.

Mental state on admission.—She was dull and apathetic, t suspicious and determined as far as was in her power to ist nursing attention. She had visual and auditory llucinations; she stated that she "saw dreadful faces," at "something had happened to her" and that "this ered everything"; she felt "she had no head"; voices ld her not to eat her food, people sneered at her and sjudged her; she thought she was ill and could not get ll but would not die. She had previously threatened to ll herself by hanging and by drowning.

Physical state on admission.—She was extremely emaciated, ighing only 4 st. 10 lb., about half her average weight ig. 1). Her muscular system was almost completely onic with the exception of the muscles of mastication, hich were in spasm, great difficulty being experienced in opening her mouth for feeding purposes. Her extremities were cyanosed; the deep reflexes were increased and there was bilateral ptosis, dental caries, and gingivitis. Menstruation had been regular until nine weeks before admission, since when it had been in abeyance.

Course.—For many weeks the patient lay in bed in a state approximating to that of a catatonic stupor. On account of the septic condition of her mouth she was given anti-streptococcal serum daily in increasing doses for a week, the last dose being 50 c.cm. She showed no interest whatever in her surroundings and had to be forcibly fed; the muscular system remained completely atonic, there was no control of the sphincters, and the temperature was subnormal, varying between 96° and 97·6° F., the average being below 97°. The Wassermann reaction was negative. The mental and physical condition slowly deteriorated until March 11th, 1928, and the weight fell to 4 st. 5 lb.

FIG. 1.



Showing extreme emaciation of the patient on admission to hospital.

On account of the atonic condition and suspected pituitary disturbance, the patient was given 1 c.cm. of pituitrin twice daily from March 11th, 1928, till June 26th, 1928 (once daily during the latter part of the time). She now showed a decided improvement in the muscle tone and general circulation and some signs of interest in her environment, and would take her food without resistance from a particular nurse. Her eyes were fixed and staring and she was unable to close them, even when stimulated by a bright light or a loud noise or by sudden movement of the hand over her face. On August 7th, 1928, two septic teeth were extracted by Mr. T. Yoxall, and similar dental treatment was carried out at monthly intervals until a complete clearance was effected. She continued to improve, and on Sept. 15th, 1928, she was able to sit up in a chair. She could reply to questions by monosyllables only after a long latent period, but her face was mask-like and her hair was limp and lustreless.

Gradually improvement took place and she was able to perform simple movements. She could hold a spoon, and when taught to feed herself continued the act in an automatic manner, not, however, stopping

when the plate was empty or even removed. During this period she was unable to accommodate for near vision; she exhibited a curious affection of locomotion, being able to walk when assisted to start but unable to accelerate, retard, or make even a slight turn. In this state she walked into the wall or any obstacle. By Christmas, 1928, she began to show a little more interest in her surroundings, although it was not for another six months that she was able to move her eyelids voluntarily. Menstruation returned in February, 1929, and by the end of May muscle tone

FIG. 2.

Showing the stuporose condition of patient before treatment contrasted with her appearance on recovery.

had improved sufficiently to enable her to pick up a pencil. It was not until the end of June that she could approximate thumb and index-finger, and the grip was still weak; by the end of July she could approximate thumb and little finger and her grip became quite good. She continued to improve, the last noticeable return of voluntary movement being that of rising from a sitting position. Previously she could not initiate this process until her arm was touched.

She was discharged recovered on Nov. 14th, 1929. At that time she was able to carry on a conversation with normal intelligence without psychomotor retardation. She had insight into her illness, helped in the ward, could carry piles of plates without mishap, took an interest in her environment and in the social events of the hospital, could dance well, and was able to write a sensible well-penned letter on Sept. 23rd, 1929. Her facial tone, mobility, colour, stance, and carriage of body were that of a normal person and contrasted to an extraordinary degree with the atonic stuporose condition in which she had so long existed (Fig. 2).

COMMENT.

Pituitary cachexia, as described by Simmonds in a case of necrosis of the anterior pituitary by a septic embolus, showed the clinical features of cachexia, senility, loss of pubic and axillary hair, and general nervous disturbances. Thirty-four such cases have been described up till the year 1928. Amongst the various symptoms ascribed to the condition this case presents a parallel in the following:

(1) Cachexia; from a normal of 8 st. 8 lb. her weight dropped to 4 st. 5 lb., and later rose to 9 st., a difference of 65 lb. (maximum published, 110 lb.: Simmond's case). (2) She presented a wrinkled, senile appearance. (3) Pubic and axillary hair w definitely scanty. (4) General nervous disturbance v severe, necessitating her certification and admiss to a mental hospital. (5) Trophic vaso-motor s disturbances were a marked feature; there v extreme cyanosis of the extremities and bedso were threatening on admission. (6) The skin v dry, rough, and scaly. (7) Muscular weakness v extreme. (8) She had a subnormal temperatu ranging between 96° and 97·6° F. (9) Her bl pressure was obviously very low, the systolic press being roughly estimated at 90 mm. (10) Gas disturbance was shown by the persistence of undiges food (as evidenced by stomach washings bef a tube feed) for 18 hours or more. (11) Her ba metabolism was 89 per cent., 91·3 per cent., 93·6 cent. on three occasions whilst asleep in the respirat chamber of the Joint Board of Research. (12) Mer torpor and apathy were a distinct clinical featu (13) Menstruation ceased nine weeks before admiss and returned 15 months later when she was recoveri (14) The improvement after injection of pituitary; has given excellent results in the published cases.

My thanks are due to Dr. T. C. Graves for permis to publish this case.

EXPULSION OF AN ECTOPIC FŒT PAPYRACEUS

AFTER UTERINE CURETTAGE

BY KENNETH MCFADYEAN, M.R.C.S. ENG.

THE following case of ectopic papyraceus fœ occurred in my practice last year; it is an exam of a very rare condition.

A multipara, aged 34, with three children, the youn of whom is aged 4, appeared to menstruate normally Sept. 24th, 1929. On Dec. 15th, 82 days later, she severe uterine hæmorrhage accompanied by sickness, sl fever, and acute abdominal pain on the left side. A pr tioner who examined her expressed the opinion that she pregnant, that the pregnancy had not been interfered w and that it would probably pursue its normal cou During the first week of January, 1930, there was fur very slight hæmorrhage. On Jan. 14th a bi-manual ex nation was made, and the uterus was found to be about size of a three months' pregnancy. At this time the pat stated that she no longer felt pregnant. A week later t was further slight hæmorrhage. On Jan. 27th there w small quantity of brown discharge. Examination reve no alteration in the size of the uterus. Surgical interfer was advised.

On Feb. 1st dilatation and curettage was perfor a tent having been introduced the previous evening. sound was first passed and appeared to enter an en uterine cavity 3 inches in length. After dilatation a fi was introduced, and the cavity carefully examined. patient was thin, with a lax abdominal wall, so that manual examination was easy. There was an indefi mass to the left of the uterus, the latter being distin globular in shape and freely movable. Nothing was in the pouch of Douglas or in the uterine cavity exc in the latter, a very soft, easily separated lining which thicker in the upper part on the left side. The entire of the uterus was freely scraped with a blunt cure hæmorrhage was severe and could not be checked by douching. The cavity was packed. Subsequently patient was given injections of half a cubic centimetr pituitary extract six-hourly. Microscopically the scra showed a decidual reaction.

On Feb. 2nd, at 11 A.M., the temperature rose to 10 and the pulse-rate to 132, while the patient had a and severe abdominal pain on the left side. The ute packing was removed without hæmorrhage. Pain persi all day and night. On Feb. 3rd, at 10 A.M., the tempera was 102° F. and the pulse-rate 120; a fœtus was expe The umbilical cord was wound tightly three times r the neck, while the proximal end was attached to a reta placenta. At 6 P.M., after further severe pain in the

of the abdomen, the placenta was expelled. The temperature fell to 99° F. and the pulse-rate to 98. The placenta, with some retro-placental blood clot, formed a cylindrical dry mass just under 4 inches in length and inches in diameter at its widest part. The patient made uneventful recovery and has menstruated normally since. The fœtus was examined by Dr. Audrey Russell, of the Institute of Anatomy, University College, London, who has kindly furnished the following report: (1) Gross anatomy: Decomposition had proceeded to mummification. The neck, extremely thin, showed a circular furrow, caused by the umbilical cord. The general development was that of a three months' embryo. (2) Radiogram: The vertical column in the cervical region showed great disturbance, with suppression of some of the centres of ossification. The centres of ossification were present in all the metacarpals, the phalanges and terminal phalanges in the hand, and in the metatarsals and terminal phalanges in the feet, indicating an age of about 83 days. The ends of the long bones show a line of arrested growth, suggesting that the embryo had had a precarious existence for a week before death. (3) Umbilical cord: 14·5 cm. long, was under one-tenth of an inch wide and flattened. Much of Wharton's jelly had been absorbed. The placenta showed advanced post-mortem degeneration, while a large retro-placental blood clot had been partially organised.

The conclusion from these data is that the pregnancy was isthmial, and that the fœtus died on Dec. 15th, being 82 days old, and was retained until the date of operation seven weeks later.

AN UNUSUAL ROUTE OF INFECTION IN CHOLECYSTITIS.

By R. Rutherford, F.R.C.S. Eng.,
SURGICAL REGISTRAR, KING'S COLLEGE HOSPITAL, LONDON.

Much has been written and much labour has been expended on discovering the various ways in which the gall-bladder may become infected. Undoubtedly in the vast majority of cases infection is carried by the blood stream. It may be useful, if merely to cite an exception to the general rule, to place on record the following interesting case.

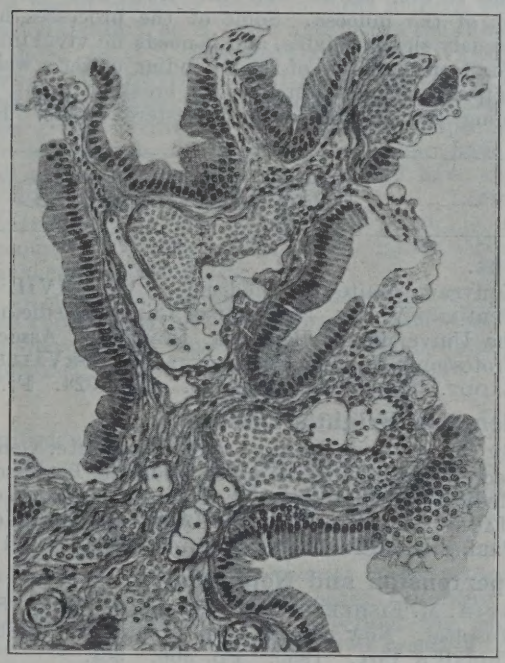
Fig. 1.

Gieson preparation showing excessive fibrosis in the gall-bladder wall in the vicinity of the adherent vermiform appendix. (× 35.)

The patient, a stout, unmarried female, aged 27 years, complained of pain in the gall-bladder region for some months. She also complained of indigestion, flatulence, constipation, and occasional pain in the right shoulder on. She had not suffered from vomiting or jaundice.

On physical examination tenderness under the right costal margin was elicited, but no tumour could be felt. A cholecystogram was done, and the gall-bladder was found to fill with the dye, and the radiogram, after a fatty meal, showed normal emptying of the viscus. The temperature and pulse-rate were normal. No stones were seen. A diagnosis of cholecystitis was made.

Fig. 2.



One of the papillary processes of the mucous membrane, highly magnified (× 190), taken from the vicinity of the adherent appendix. Note the vascular engorgement, the pavementing, and the commencing diapedesis.

An operation was performed, and the gall-bladder was seen to have lost its normal bluey appearance, and to be the seat of inflammation. In apposition with the gall-bladder were the cæcum and an inflamed appendix. Cholecystectomy and appendicectomy were performed, and the patient made an excellent recovery.

About the ninth week of intra-uterine life, the mid- and hind-gut assume their cœlomic position by retreating at the site of the future umbilicus, the hind-gut being the last portion to return. The cæcum comes to rest just below the liver, and rotation takes place. The transverse colon and descending colon come into being as anatomical entities, and the cæcum undergoes a relative displacement to its final resting place in the right iliac fossa; thus an ascending colon is formed.

In the case just cited the early fœtal position of the cæcum had been maintained, but the cæcum and the appendix were of the normal adult type. An ascending colon consequently did not exist.

The mode of infection was not apparent until sections were made of the whole gall-bladder wall. It was then observed that the serous and muscular coats had borne the brunt of the infection, and that the mucosa had almost entirely escaped. The section stained by the van Gieson method (Fig. 1) showed that fibrous tissue had been laid down in the muscle coat, and there was a dense fibrosis outside it. The blood-vessels were engorged; pavementing in their lumen and diapedesis had commenced (Fig. 2). A few polymorphonuclear and plasma cells were seen, particularly round the vessels. The mural vascularity was most marked in one segment of the section; it

was also at that point that the inflammatory cells were most in evidence, and relatively higher vascularity was also marked beneath the mucosa. This segment was regarded as the part of the viscus which was most nearly in apposition to the inflamed appendix (Figs. 1 and 2).

The section shows well the frond-like arrangement of the mucosa. Some of the processes have extremely slender stalks, and it needs no vivid imagination to picture one of them bending under a weight of imprisoned cholesterol to the breaking point, and forming the nucleus of a cholesterol stone. Here is an example of a case in which slight inflammati may just disable the gall-bladder and render it un for the normal cholesterol metabolism.

The appendix in section was seen to be the seat o chronic inflammatory process, as evidenced by t fibrous thickening of its walls, the vessels bei injected and the lymphatics infiltrated with infla matory cells, showing the superposition of a rece inflammation.

I am indebted to Mr. C. P. G. Wakeley for permission publish this case, and for the use of the excellent microsco slides and drawings.

REVIEWS AND NOTICES OF BOOKS

Reins.

Nouveau Traité de Médecine. Vol. XVII. By FERNAND WIDAL, Professor of Clinical Medicine in the University of Paris; A. LEMIERRE, Associate Professor in the same University; PASTEUR VALLERY-RADOT. Paris: Masson et Cie. Pp. 1024. Fr. 125.

Œdema of Bright's Disease.

By CH. ACHARD, Member of the Institute, General Secretary of the Academy of Medicine, Professor of Medicine in the University of Paris. Translated by MAURICE MARCUS, M.B., B.S.Lond. London: Kegan Paul, Trench, Trübner & Co., Ltd. 1930. Pp. 231. 9s.

Hypertension and Nephritis.

By A. M. FISHBERG, M.D., Physician, Mount Sinai Hospital, New York City. London: Baillière, Tindall & Cox. 1930. Pp. 566. 30s.

IT is a matter of common knowledge amongst students and medical men that as a rule books on nephritis do not serve to diminish the confusion prevalent on this difficult subject. It is therefore gratifying that in one season three books of outstanding merit should appear, any one of which is calculated greatly to increase the knowledge of any careful reader.

The 17th volume of Masson's System of Medicine deals with renal disease. It was about to appear when the medical profession in France suffered the loss of its principal author, the late Prof. Fernand Widal, who was also one of the general editors of the whole System. The work contains in its thousand pages the fruits of the lifetime of observation and research which this great physician had devoted to medicine, particularly to the diseases of the kidney. When he died, it was curious that his contributions to general bacteriology received most praise abroad, at any rate in this country; in France his name is renowned mainly for the magnificent work which he devoted to renal disease. A captious reader may find in this massive volume too much special pleading; the authors have indeed stated the case in favour of salt retention in nephritis with a force which many modern pathologists and physicians might consider exaggerated, but at a time when the views of Widal on this subject are being critically re-examined it is satisfactory to have those views expressed in clear and complete terms. The volume is valuable, moreover, for its lucid exposition of many of those first principles of biochemistry and of the essentials of morbid anatomy, without which no one can properly undertake a study of renal disease. The subject matter is arranged logically, and the illustrations, some of which are in colour, are adequate. The book is not confined to nephritis, but contains sections dealing with tuberculosis and syphilis of the kidney, renal calculus, malignant and parasitic diseases of the kidney, and the vario abnormalities of the urine commonly encountered medicine.

Prof. Achard is well known in this country for critical work on œdema and the work now publish in English by the Anglo-French Library of Medi and Biological Science is a notable addition to t literature. Prof. Achard writes clearly and has breadth of outlook which makes his views on œde in Bright's disease of great educational value. T discussion of salt retention on page 135 could scarc be bettered, and the section dealing with the collo of the blood and the theories of oncotic pressure admirable. The book will not, perhaps, make a w appeal but no one who is endeavouring to master complex problem of œdema can afford to ignore and no one who appreciates the difficulties of subject can fail to admire the skill with which author has displayed the facts. The translat throughout is well done; we have detected only bad slip, where (p. 219) the sodium ion is refer to by the word "Nation."

Lastly, an adequate survey of the whole subj of nephritis is contained in Dr. Fishberg's book. T American author is best known in England by work on blood pressure; he deals here with an e more complicated aspect of medicine. The chapter to the work is XI., where the classificatio Bright's disease is fully considered. Starting wit historical survey of the position before and during epoch of Richard Bright, Dr. Fishberg discusses classification, still prevalent in certain text-books renal disease, into parenchymatous and intersti varieties. After quoting the views of Wilks and Gull and Sutton, and of their successors in Germa he points out that this classification is now indef sible and should no longer be taught to students. proceeds to discuss the functional classificatio Bright's disease into supposed nitrogen-retaining chloride-retaining types, and again is able to dem strate the irrational nature of such a division. Fin he adopts as a classification acceptable in the pres state of our knowledge one which is essenti similar to that of Volhard and Fahr, which pla true inflammatory nephritis midway between degenerative nephroses at one end and the ischæ affections of the kidney at the other. The book whole supplies a clinical, experimental and pat logical demonstration which justifies this classificat The views here expressed are those of a small instructed body of physicians, representatives whom are to be found throughout the world. Wh indeed, the accumulated wisdom which is to found in the three books now under review filters the text-books, medicine will have made a g advance.

A System of Bacteriology in Relation to Medicine.

By Various Authors. Vol. V. Pp. 420. London: H.M. Stationery Office. In 9 volumes. £8 8s. or £1 1s. per volume.

THE fifth volume of the System of Bacteriology published by the Medical Research Council comprises sections on the pfeifferella (*B. mallei* and *B. whitmori*), the corynebacteria (*B. diphtheriæ* and the diphtheroids), the acid-fast group (*B. tuberculosis*, Johne's bacillus, the leprosy bacillus and the non-pathogenic acid-fasts), the brucella (*B. melitensis*, *B. paramelitensis*, and *Br. abortus*), anthrax, the non-pathogenic spore-bearing bacilli, *B. tularense* and bartonella and allied organisms.

The volume reaches the same high standard as its predecessors. Of the earlier portions of the book special mention may be made of the sections by Prof. R. Tanner Hewlett on *Corynebacterium diphtheriæ* and the diphtheroid organisms, particularly the portions dealing with laboratory diagnosis in diphtheria, and the section on the modern work with the Schick test. We wish that everybody concerned with the diagnosis of diphtheria would read the section on the laboratory diagnosis. There is hardly any branch of bacteriology where so much slipshod rule-of-thumb work is done as in the diagnosis of diphtheria, and the whole section, from the collection of material to the virulence test at the end, is a practical common-sense presentation of the subject. Prof. Hewlett writes with moderation on the relationship of the avirulent to the virulent diphtheria bacillus, about which there is much conflicting evidence. The section closes with a long description of the diphtheroids, including *C. hofmanni*, *C. xerosis*, *C. acnes*, and some of the lesser known diphtheroids producing disease in animals.

Nearly half the book is occupied with the acid-fast group of bacteria, of which 175 pages are devoted to the tubercle bacillus itself in all its bearings. In this section Dr. Stanley Griffith writes on the morphology and cultivation of the tubercle bacillus, experimental tuberculosis, and the distribution of the bacillus in man and in animals. This piece of work summarises the labour of many years. Dr. Griffith gives a fair summary of the vexed question of the filtrable form of the tubercle bacillus and discusses eugonic, dysgonic, and atypical strains of a bacillus—a subject on which his long research qualifies him to speak with authority. His chapter on tuberculosis in man includes an account of the portals of entry and a summary of work on the bovine bacillus in man. He also contributes a chapter on tuberculosis in cold-blooded animals, which contains much information not readily accessible elsewhere in English text-books. The section on allergy and immunity in tuberculosis by Dr. W. H. Tytler is very good. He gives a comprehensive well-reasoned survey, in the space of 50 pages, of a very difficult subject, and supplies a valuable bibliography. This section is indeed almost a complete monograph in itself. A short article on the preparation and standardisation of tuberculin by Dr. C. C. Okell brings together work on this complicated subject which has hitherto been scattered in journals and League of Nations reports. It is regrettable that more space was not allotted to the laboratory diagnosis of tuberculosis. For example, to dismiss in less than four lines the difficult task of finding the tubercle bacillus in pleural fluids is not helpful. The provision of a short chapter on the chemistry of the tubercle bacillus and other acid-fast bacteria, covering the ground of the first four chapters of Wells, De Witt, and Long's book on this subject, would have been valuable. In the section on chemotherapy in tuberculosis Prof. S. Lyle Cummins gives an excellent account of sanocrysin, and his last two paragraphs at the end sum up its possibilities with impartiality.

The article on leprosy by Dr. Ernest Muir, of Calcutta, is a useful summary which includes modern work on the cultivation of *B. lepræ* and brings the subject up to date. Dr. J. T. Duncan, Dr. L. E. H. Whitby, and Dr. A. D. McEven deal with the brucella group of organisms. Much new work has been published on this group during the last few years, especially on *Br. abortus* infection in cattle, the authors have made full use of the available material and have supplied a good bibliography. Prof. J. C. G. Ledingham contributes a chapter on tularæmia which includes an account of *B. tularense*, one of the latest arrivals in pathogenic bacteriology.

To every section of the volume Prof. W. Bulloch has contributed pithy historical introductions which supplement the long historical essay by him which appeared in the first volume of the System.

Injuries to Joints.

Third edition. By Sir ROBERT JONES, Bart., K.B.E., C.B. London: Humphrey Milford, Oxford University Press. 1930. Pp. 192. 6s.

THIS little book first appeared during the war and achieved an immediate popularity amongst those who were called upon to handle battle casualties. But, unlike most primers of that period, the book has continued to make appeal in civil practice. In the third edition nearly all war references have been deleted, and the principles of treatment are applied to everyday practice. Apart from these changes the only important addition is a few pages on Volkmann's ischæmic contracture, a subject much discussed at medical meetings and in the scientific press in recent years. The author has wisely preserved the character and size of the book and has not increased the number of pages. It is a handy pocket size and is not overburdened with detail; it can be read in a few hours and provides a useful and authoritative guide in the treatment of joint injuries.

Physiological Principles of Hydrology.

By R. G. GORDON, M.D., D.Sc., F.R.C.P.E., Physician to the Royal Mineral Water Hospital, Bath, and to the Bath, Somerset and Wilts Orthopædic Hospital; and F. G. THOMSON, M.A., M.D., F.R.C.P., Physician to the Royal United Hospital, Bath. London: Jonathan Cape. 1930. Pp. 131. 5s.

THIS is a short and readable book by two practising spa physicians. The authors have set out to write something which may help the practitioner to decide himself whether hydrotherapy will be likely to benefit his patients. Chemical formulæ have been avoided and an attempt has been made to give a physiological explanation of the action of waters. They hope that the reader may realise that hydrotherapy has its own special place in treatment, that the action of waters depends more on their physical than on their chemical properties, and that a cure depends on the power of the remedy to alleviate the underlying cause of the disease.

The first chapter contains an excellent short historic account of hydrology from Hippocrates up to the present day. Then follow four chapters on

physiology in its relation to medical hydrology. On the whole this is the least satisfactory part of the book. It would certainly be much improved if the references were supplied at the end of each chapter, so that the reader might know the authority on which the various statements are based. A few mistakes occur. Thus on page 32 thyroid deficiency is stated to be accompanied by a decrease in the respiratory quotient when the authors evidently mean the respiratory exchange. Again, they state that any method that will remove carbon dioxide from the body will increase oxidation and so prevent the formation and decrease the existing amount of fat in the body. The easiest way to remove carbon dioxide is to perform forced respiration; but there is no marked increased oxidation under these circumstances, only an alkalosis. On page 54 it is stated that in a hot immersion bath breathing becomes deeper and more rapid with a corresponding increase from 50–100 per cent. in the intake of oxygen and the elimination of CO_2. These statements rather suggest that the increased metabolism follows on the increased pulmonary ventilation, whereas it is almost certain that the opposite is true. Over 20 years ago Sutton showed that a rise of body temperature was accompanied by an increase in the respiratory exchange. However, the pulmonary ventilation is probably in excess of that required to eliminate the extra CO_2 produced and so there is an increased alkalinity of the blood and of the urine. This sequence of events is not expressed clearly in this book. The last chapters are certainly the most successful. In Chapter VI. there is a particularly valuable list of places in this country, in Europe, and also in Egypt where different types of waters are found Chapter VII. gives a good account of the various kinds of baths, while Chapter VIII. deals with the diseases which are commonly treated at hydrological stations.

Radiologie clinique du tube digestif: œsophage, intestin, foie et glandes annexes.

By J. GATELLIER, Professeur agrégé à la Faculté de Médecine de Paris, Chirurgien des Hôpitaux de Paris; F. MOUTIER, Chef de Laboratoire à la Faculté de Médecine de Paris; and P. PORCHER, Chef de Laboratoire de Radiologie à la Faculté de Médecine de Paris. Paris: Masson et Cie. 1930. Vol. I. Pp. 176. Vol. II. Pp. 389. Fr.330.

THESE two volumes are in continuation of a series of radiological atlases, other volumes of which we have already reviewed. Those hitherto published deal with the normal and pathological osseus system, the stomach and duodenum. The present volumes continue the alimentary tract and illustrate the normal and pathological œsophagus, the small and large intestines, and the accessory organs of digestion—the salivary glands, the liver, the gall-bladder, the pancreas, and the spleen. The system of explanatory line drawings adopted in the previous volumes of the series has again been used, and is a very helpful way of interpreting the radiograms. We have described this series as an atlas, but it is really more than this. In addition to the explanations of the radiograms, a considerable amount of text is included in each volume. All the conditions dealt with are well described, and an account of the pathology is given, besides full notes on the radioscopic and radiographic examination of the organs. The work is very complete, and every condition that it is possible to examine radiologically appears to have been included. The descriptions and illustrations of the large intestine are particularly well done. The volumes will be useful, both as books of reference and as an easy source of typical example of recognised radiological appearances.

Development of Sex in Vertebrates.

By F. W. ROGERS BRAMBELL. London: Sidgwic and Jackson. 1930. Pp. 261. With 24 plate and 25 text-figures. 12*s*.

Dr. Brambell's book deals with two subjects whic while distinct, are in many ways closely related (1) the phylogenetic evolution of the sex apparatu gonads, and sex cells; and (2) the determination sex in the individual. He weaves together classic morphology and experimental physiology into a ver clear account of a branch of knowledge which h made enormous advances in the last 10 or 15 year and the whole will be best appreciated if the la chapter is read first. The account of sex chrom somes and sex reversal is of particular interest, an the apparent contradiction between the chromosom theory and the facts of reversal seems to have bee satisfactorily settled.

Die seelischen Heilmethoden des Arztes.

By Dr. MAX LEVY-SUHL, Berlin-Wilmersdor Stuttgart: Ferdinand Enke. 1930. Pp. 28 M.15.

FROM these pages, written for the practitioner an concerned with the treatment of the neurotic, it ma readily be gathered that Dr. Levy-Suhl is not onl thoroughly conversant with different psychopath logical theories and psychotherapeutic methods, b applies with skill whichever he deems appropriate his clinical material. Illustrative instances a furnished of the most diverse types of case, som treated by simple suggestion, some by hypnosi some by analysis, some by combinations of techniqu Attractive little appendices are given at interval dealing briefly yet instructively with theoretic questions as they arise in the course of practice. T volume serves a useful purpose and can be recon mended for its eclecticism no less than for its breadt of view.

REPORTS AND ANALYSES

CONSTANTINO'S QUINA-PORT.

(PREPARED BY CONSTANTINO LTD., OPORTO.)
(SOLE AGENTS (WHOLESALE ONLY) J. AND G. OLDFIELD, LT 9, CHARLES-STREET, LONDON, S.W.)

THIS wine is described as "super tonic" an "rejuvenator," and is claimed to be made from pu old matured port, with which is incorporated quinin and other substances of a tonic character. Whe analysed the following results were obtained:—

	Per cent.
Alcohol by volume	19·5
equivalent to proof spirit	34·0
Fixed acidity, as tartaric acid	0·45
Volatile acidity, as acetic acid	0·03
Ash	0·27
Organic solids	13·88
containing glucose	11·50

and small amounts of quinine, &c.

The wine is of a natural port colour and free fro preservatives; the flavour is distinctly agreeable, and modified but very slightly by the presence of quinin

Such a product as this Quina-port merits the co sideration of the practitioner, as the tonic characte of the added medicaments and those natural to po wine are combined in an agreeable and palatable form

THE LANCET.

LONDON: SATURDAY, AUGUST 16, 1930.

DRAINS.

THERE is no conviction which dies harder in the public mind than that the control of communicable diseases is a problem of drainage. Hardly a day passes which does not bring to a big health department some urgent message about drains, with expressions of anxiety as to the prospects of an epidemic. Recently a circular issued by a medical officer of health, in which it was pointed out that drains had nothing to do with diphtheria, was the subject of indignant protests by plumbers, both locally and in the *Plumber*. It is easy to see how this has come about. In the second quarter of the nineteenth century the problem of public health was to the public mind the eradication of cholera, and the Royal Commission on the Health of Towns and Populous Places and the work of CHADWICK and his co-labourers demonstrated forcibly the association between epidemic occurrences and the insanitary conditions of the places where people had congregated as the result of the industrial revolution. It became evident that the primitive water-supplies on which the people still depended were grossly polluted as the result of the equally primitive means of disposing of excrement; and there can be very little doubt that the disappearance of cholera and the almost complete abolition of the alimentary infections in modern communities is the result of the attention devoted since these days to sewage disposal and communal water-supplies.

It is not so clear why the faith thus engendered in the beneficent influence of good drainage should have extended to those communicable diseases which do not as a rule gain access to the human body by the alimentary route. Presumably it was due to an association of ideas and imperfect understanding of the modes of transmission of these diseases. It is mostly in relation to diphtheria or sore-throats in general that the public are still concerned about defects of drainage, and it must be admitted that the pronouncements of the medical profession and sanitarians have been largely responsible for this point of view. STEVENSON and MURPHY, in their book written in 1892, said: "The spread of diphtheria has been ascribed to the pollution of air by emanations from sewers, and certainly there is a close connexion between the sanitary condition of a district and the occurrence of this disease; the inhabitants of houses into which sewer gas enters are especial sufferers," and this was expressive of the belief generally held at that time by those who were responsible for the care of the public health. The nature of the infection and the conditions precedent to its propagation were not yet fully understood. The diphtheria bacillus had been described by LÖFFLER in 1884, its toxin separated by ROUX in 1888, the antitoxin produced by BEHRING and KITASATO in 1890 and 1893, and a commencement made with the treatment of diphtheria with antitoxin in Paris and Berlin in 1894. LÖFFLER himself had hinted at the presence of the bacillus in apparently healthy throats, and PARK, as the result of his investigations in New York, in 1893, suggested that probably 1 per cent. of the healthy throats in that city were infected. Since these discoveries were made there has been a gradual growth of knowledge on the transmission of infection, and we have come to realise that, at least so far as the air-borne infections are concerned, their epidemicity is a problem of mild infections and carrier states rather than of sanitary circumstances which can be controlled by any engineering works. We find, then, in modern text-books statements such as these: "When sewer air leaks through a defective fitting into the air of a house its noxious influence, if any, is further attenuated. There is no evidence that under such conditions it either causes specific disease or predisposes to it" (CURRIE). A slightly more cautious note is struck by JAMESON and PARKINSON, who say: "The continued inhalation of drain and sewer air has been thought to predispose to a general loss of health, e.g., anæmia, headache, vomiting, sore-throat, skin eruptions, and diarrhœa. Possibly only a reduced vitality is produced, which renders the individual more susceptible to bacterial infection." In the second edition of PARK'S "Public Health and Hygiene," published in Philadelphia in 1928, no mention whatever is made of drainage in the part devoted to diphtheria, and the only statement bearing on the subject is under the heading "General Municipal Sanitation," where, in relation to bad plumbing, it is said that "these conditions result in pipes and fixtures which leak and are a menace to health," which reads rather as a vague concession to former teaching than as a convincing pronouncement of modern views. ROSENAU (1927) says bluntly: "Formerly, imperfect drains and sewer gas were given as the cause of diphtheria; this is a fetish which dies hard." Finally, those who read Dr. HASLAM'S book on "Recent Advances in Preventive Medicine [1]" will find the following introductory comment which leaves no doubt about the change of outlook on the care of the public health. He says:—

> "Text-books and teachers have long combined to convey the impression that preventive medicine was the special province of those more interested in drains and damp-proof courses than in human ills, though the long held belief in the close connexion between drains and the infective fevers permitted the preventive doctor to concern himself with the latter. Nowadays it is hardly going too far to say that all medicine is preventive medicine."

Until recently most public health departments made the occurrence of communicable disease in a house an excuse for examining the drains, and no doubt this practice persists in many towns.

[1] J. and A. Churchill. 1930. Pp. 328. 12*s*. 6*d*.

The reason for its continuance is due to the fact that the law permits of drain-testing only if the responsible officers can establish reasonable grounds for suspecting that the drains are defective. In the absence of a case of fever it is rarely possible to find such evidence, yet in practice it has been found that the routine tests made at infected houses do discover very many defects of drainage, and their discontinuance would undoubtedly lead to a deterioration in the condition of house-drains. On general principles it is undesirable that anything which is offensive or objectionable or nauseating should be allowed to continue, and it is not surprising, therefore, that the health departments are reluctant to forego any opportunity of making these examinations. Until there is some amendment of the law, however, it is essential that the misleading educational influence of this practice should be counteracted by constant instruction of the public as to the truth concerning the transmission of disease. Practitioners of medicine are sometimes guilty of expressing obsolete views on this topic. Their great influence carries with it a responsibility for helping to guide the public away from the erroneous conceptions of infection which are so commonly held.

GALL-BLADDER DISEASE.

INQUIRY goes on into the causation of gall-stones and of inflammation of the gall-bladder. Clinical study and laboratory technique, especially Graham's cholecystography, have thrown light on the diagnosis and symptomatology of these conditions, but until we have a clearer understanding of their ætiology we can do little to prevent their occurrence. All are agreed that a large proportion of gall-stones have their primary origin in an infection of the biliary tract, although a certain number may be metabolic in origin, the best example of these being the pigment calculi found in acholuric family jaundice. In most cases, however, the two conditions—stone and inflammation of the lining membrane—are found together, leaving room for discussion as to which of the two occurred first. Mr. A. J. WALTON,[1] in a recent review in our columns, was strongly of opinion that the initial change is most frequently an inflammation which gives rise later to calculus formation. Even with a pure cholesterol stone, which has been generally regarded as metabolic in origin, WALTON found inflammatory changes in the gall-bladder in every one of his own 23 cases. What, then, are the factors which lead to infection of the gall-bladder and biliary passages? Clearly infection may reach the bladder (1) through the common bile-duct and the cystic ducts from the duodenum; (2) via the portal vein; (3) through the systemic circulation; or (4) by direct or lymphatic spread from the liver. As a result of his closely reasoned survey, WALTON leaned towards a blood-borne infection, at first a part of a general infection or mild septicæmia.

There are many clinical features to support this view, which is also in harmony with the experimental work of ROSENOW, WILKIE, and others, who have cultivated streptococci from the wall of the gall-bladder in a large proportion of cases examined in which the bile itself was sterile. ROSENOW has indicated the selective action of certain streptococci towards particular viscera, and such affinity would explain the localisation in the gall-bladder of organisms which have reached it by way of the systemic circulation. An important investigation by the Edinburgh school appears in our present issue. Dr. BRYAN WILLIAMS and Dr. D. G. S. McLACHLAN have examined the bacterial flora of 106 gall-bladders removed from the living body on account of disease. In 84 cases of chronic cholecystitis in which the gall-bladder wall was examined under strictly controlled conditions, a streptococcus was found in 17 per cent. and the colon bacillus in 23 per cent. In the great majority of those cases in which a streptococcus was found whether in the gall-bladder wall or in the cystic lymph gland, it was also present in the bile; only once was a streptococcus isolated from the bile in the absence of stone. Injection into rabbits of organisms derived from such infected human material was followed in only a small proportion of cases by a definite cholecystitis; thus, only one rabbit injected intravenously with streptococci and one injected with colon bacilli developed gross lesions in the gall-bladder. Hæmorrhages into the stomach were frequently found in these animals—an observation of some possible significance in relation to gastric ulceration in the human subject although a number of other substances may lead to similar changes.

The majority of the streptococci isolated by WILLIAMS and McLACHLAN were of the entero coccus type, suggesting derivation from the bowel. They do not conclude that any of the organisms isolated are necessarily the primary agents of gall-bladder inflammation; they may merely be secondary invaders. Their work, however, does not confirm the view that organisms usually reach the gall-bladder by means of the systemic circulation, nor does it support ROSENOW'S theory of elective localisation. Direct or lymphatic spread of infection via the liver may be of as great or greater importance. Prof. E. A. GRAHAM[2] has shown that some degree of hepatitis is an almost constant accompaniment of cholecystitis; it is also frequently found in such conditions as chronic appendicitis though rarely of such extent as when associated with disease of the biliary tract. It would seem, then, that chronic infective processes in the area draining into the portal system may lead to a hepatitis which, in its turn, permits organisms which would normally be filtered off by the liver to pass into the gall-bladder, or give rise to a direct spread of infection from liver to gall-bladder wall. Mr. E. R. FLINT has recently directed attention afresh[3] to the frequent association of hepatitis with cholecystitis and with other intra-abdominal lesions, and an unusual case is discussed by

[1] THE LANCET, 1930, i., 334.

[2] Surg., Gynecol., and Obstet., 1918, xxvi., 521.

[3] Brit. Med. Jour., 1930, i., 1041.

Mr. R. RUTHERFORD in our present issue in which direct spread of infection from an abnormally situated appendix led to infection of the gall-bladder wall and cholecystitis. It would clearly be unwise to accept a blood-borne infection as the sole cause of cholecystitis to the exclusion of a lymphatic or direct origin.

MEDICAL RESEARCH IN INDIA.

IT is a relief to turn from the troubled waters of the Indian lay press to the quiet current of scientific work in India, which goes on undisturbed. The report for 1929 [1] of the Calcutta School of Tropical Medicine, with the associated Hospital and Institute of Hygiene, shows that here, at all events, Europeans and Indians are working harmoniously for the good of humanity, and the most impassioned patriot cannot but admit that his countrymen are getting a fair chance. Of the nine professors and lecturers in the various departments five are Indians, while the posts of assistant professors, where they exist, are all held by medical men native to the country. The Director is known to search for indigenous scientific merit, and to welcome any sign of it most cordially. Colonel J. W. D. MEGAW, late head of the school, has been appointed Director-General of the Indian Medical Service, and has been succeeded by Lieut.-Colonel H. W. ACTON, who makes of his first report an opportunity not merely to describe the year's work, but to survey over a longer period the advances in tropical medicine with which the school has been specially concerned. It is an impressive record, involving important contributions to our knowledge of some of the worst scourges of warm climates.

Colonel ACTON remarks that the name of LEONARD ROGERS, who founded the school, is associated with revolutionary changes in the treatment of four of these scourges—amœbic dysentery, cholera, kala-azar, and leprosy, and it is not significant that he made use of drugs which had previously been employed. Amœbic dysentery had been treated for many years by ipecacuanha, but it was left to ROGERS to show that emetine, which later observers had prided themselves in removing from the crude drug, was really the important factor, and to demonstrate that it could be administered hypodermically with advantage. Similarly, saline injections had been given for cholera, but a laborious investigation was needed before the superiority of the hypertonic solutions was admitted. Treatment with the hydnocarpus compounds, introduced again by ROGERS, has changed the whole outlook in leprosy, and lastly, his employment of intravenous injections of sodium antimony tartrate for kala-azar led the way to the reduction in the mortality-rate of that disease which is perhaps the most striking recent result of the activities of the school. This pioneer work is most generously recognised in the report. It has to be remembered, also, that much remained to be done, and for that, and for developing the work in the directions indicated by ROGERS for a large amount of original work on other aspects of tropical medicine, Colonel ACTON and his collaborators deserve credit. One of the interesting recent activities mentioned in the report is the research on bacteriophage, initiated at the visit of Dr. D'HERELLE in 1927. Dr. D'HERELLE worked in the school for several months, and evidently imparted a full share of his enthusiasm to his colleagues there. The whole question of the use of bacteriophage is still sub judice, but Colonel ACTON is evidently impressed with their possibilities, not only as regards treatment, but also in throwing light on the bacteriology and epidemiology of cholera and dysentery. Experimental work on bacteriophage is proceeding in the laboratory and in the field. The campaign against kala-azar has now reached a satisfactory stage as far as a diagnosis and treatment are concerned. The new finger prick test with urea stibamine enables the disease to be identified almost with certainty in a few minutes, and the improved course of treatment by injection with pentavalent compounds of antimony (lasting only 5 days, as contrasted with the previous 60 to 90 days) is said to cure permanently 95 per cent. of the cases, with only 5 per cent. of relapses. There are now very few deaths in hospital from this disease, which used to be considered almost universally fatal. Work on the transmission of kala-azar is also progressing well. There is no longer any doubt that *Phlebotomus argentipes* is responsible, though the exact mode of transmission has not yet been demonstrated. Feeding experiments with these sand-flies have so far failed to produce the disease, and it is suggested that the oral route is the most likely method of human infection. Sand-flies are easily killed in the act of biting, and it is thought that the fingers may get contaminated, and the parasites be introduced to the mouth in this way. A curious point has emerged during an investigation in Calcutta. Kala-azar is not endemic in the northern portion of the city, since the sand-flies live and breed in the cowsheds, and feed on cattle; whereas in the south, where they live in fowl runs, they feed on human beings, and hence the disease is endemic.

An important feature of the school is the leprosy department. During the last year attention has been specially paid to improving the general resistance of sufferers by the administration of various remedies, of which potassium antimony tartrate, given intravenously, and sodium bicarbonate, by the mouth, have been found useful; thyroid, when used with care, is said to have proved of great value. An indigenous drug, *Holorrhena dysenterica*, which has recently been found useful in chronic dysentery, investigated both in Bombay and Calcutta, has been employed with advantage, both as a general tonic and as a treatment for dysentery—a condition often accompanying and predisposing to leprosy in Bengal. The intradermal injection of esters by multiple puncture has been found to speed up the resolution of lesions. Research is also proceeding in many

[1] Calcutta: Bengal Government Press. 1930. Pp. 116.

other directions, of which hookworm, malaria, and skin diseases are examples. The last section is in charge of the Director himself, and the clinical and laboratory work carried out has already borne much fruit. The Institute of Hygiene is now, thanks to the generosity of the Rockefelle Foundation, being developed into an All-Indi Institute, with special buildings, and its develop ment is likely to have a great and beneficial influ ence upon the study and practice of hygiene in India

ANNOTATIONS

INTERNATIONAL CONGRESS OF DERMATOLOGY AND SYPHILIS.

WHEN the Seventh International Congress of Dermatology and Syphilis met in Rome in 1912 it was decided that the next meeting should take place in Copenhagen, but it was not then anticipated that 18 years would elapse before there would be another opportunity for international rapprochement and discussion. The formal inauguration of the Eighth Congress, which was held last week from August 5th–9th, took place in the "Folketinsaalen" of the Royal Palace of Christiansborg, in the presence of King Christian, with his Prime Minister and the Mayor of Copenhagen. In his opening address Prof. C. Rasch, the Danish president of the Congress, welcomed his 965 guests, and deplored the absence of famous men, notably Neisser, Unna, Brocq, Hallopeau, and Fordyce, who had attended the last Congress but had since died. Forty-two countries were represented, and the task of the general secretary, Dr. Svend Lomholt, must have been heavy. His organisation, and the coöperation of the municipal authorities for the reception, accommodation, and entertainment of the members and associates, have been beyond praise, particularly when it is remembered that Copenhagen is a town of only 300,000 inhabitants. The programme included a visit to the Rigshospitelet of 1800 beds, where rare dermatological and venereal cases were inspected and discussed on the third day of the congress. Time was also found for a demonstration by Finsen's successor, Prof. A. Reyn, of modern methods and apparatus for the actinic treatment of lupus and allied affections of the skin. The scientific discussions were allotted to three main themes for general discussion: the Ætiology and Pathogenesis of Eczema; Immunity, Reinfection, and Superinfection in Syphilis; and Cutaneous Tuberculosis and its Treatment. Introductory papers by Darier and Jadassohn on eczema were followed by communications from Bruno Bloch, Oppenheim, Pusey, Sabouraud, and Whitfield, and ushered in a general discussion in three languages (French, German, and English), which will long be remembered by those privileged to listen and able to comprehend. Syphilis was reserved for the next day and took place in another room of the palace, simultaneously with the beginning of a series of 177 personal communications from dermatologists and syphilologists from all parts of the world. Many of these were illustrated by diagrams. clinical photographs, charts, and curves, and had to be delivered at a speed which troubled members not fully conversant with the particular language used, and hampered discussion. Much work of undoubted value escaped due notice and this suggests that the time has come for a reconsideration of the programme of nearly all medical congresses, especially international ones. There appears to be no control, beyond the time allotted to delivery—and this is often extended out of courtesy to individuals—of the suitability and quality of papers submitted for discussion. While most of these are doubtless of value, many are not up to international standard, or could have bee further pruned with advantage. A tribunal set u in advance by the delegates would find no difficulty although it might incur some odium, in dividing th communications submitted to almost any congres into three categories: (1) those accepted for discussion (2) those accepted for publication in the printe proceedings; (3) those rejected: (*a*) for reason of inadequacy; (*b*) for revision, curtailment, an subsequent publication. This Congress suffered les from unsuitable communications than many other but even here some process of preliminary selectio would have served to make the week even mo profitable to dermatologists of all countries.

ON GIVING ADVICE TO THE TUBERCULOUS

THERE is often an air of infallibility about th giver of advice. He is so certain he knows and s sure also that the recipient does not. Small wonde therefore, if the modest physician hesitates to d more than answer specific questions from individu patients. But since, as Dr. F. M. Pottenger remarks "intelligence is the most potent factor that ca be directed against disease," no doctor can in practi refrain from giving general advice, especially in disease involving habits of life, like tuberculosi Three recently published books on this subject, a of them in their own way excellent, show i what different ways the task may be approache Dr. Pottenger's book, now in its second editio attacks the subject from a physiological basis an goes into fuller detail than most other writers for th layman. "No question," he says, "asked by a earnest patient is too insignificant for an answe and no fact that will aid him in recovering healt should be withheld from him." Starting out from th point of view, sections on the CO_2 content of the ai the principles of metabolism, the mechanism of pr duction of cough, temperature regulation, and lik questions are the natural outcome of a conscientio desire to tell the patient every relevant fact. Th method is obviously only applicable to the mo intelligent patients in private practice and sanatorium and cannot be applied to the hospital class. Moreove it is a method requiring much foresight and intuitio if the patient is not to become neurotic. But, give the suitable patient and the wise physician, it a course satisfactory to all parties. Dr. Pottenge book is an admirable corrective also to that ligh hearted class of physician who thinks his duty end when he has advised his tuberculous patient to tak a sea voyage or to go and live in the country an take up poultry farming. "I would rather be treate intelligently in the worst climate than be allowe to run wild in the best," is a dictum of Dr. Pottenge which not only patients but physicians shou ponder. Dr. F. J. C. Blackmore,[2] tuberculos

[1] Tuberculosis and How to Combat It. A Book for t Patient. Second edition. London: Henry Kimpt Pp. 275. 10*s.* 6*d.*

[2] The T.B. Patient's Guide. London: Cassell and 1930. Pp. 76. 1*s.* 6*d.*

officer for Woolwich, has devised a little pocket manual to meet the needs of the patient who attends the tuberculosis dispensary, especially in the London area. He gives advice on home treatment, the sanatorium, complications and their treatment, employment, and so forth. Dr. Blackmore stresses the point that failure is often due simply to lack of knowledge on the part of the patient. In this book little or no physiological theory is included, but many practical points. The patient is told what sanatoriums exist (especially in the London area), what rules he will be expected to comply with on admission, and what clothes he should take; how to disinfect his crockery and dispose of his sputum; what State and voluntary funds may help him (some useful information on National Health Insurance and approved societies is included), and what occupations are suitable for him when he reaches the stage of "cure." Different again is the aspect of tuberculosis discussed by Dr. Kurt Klase,[3] Director of the Prinzregent-Luitpold-kinderheilstätte of Scheidegg. His book, written in German, is designed solely to explain the meaning of tuberculosis in childhood to the lay public. Its most valuable content is the removal of the fear that tuberculosis in childhood is the appalling and fatal disease which the Victorian novel taught the public to believe. Dr. Klase points out in simple language that in childhood infection with the tubercle bacillus is the rule rather than the exception in modern civilised life, but that this infection is by no means a thing to be afraid of and is very different from the acute fatal tuberculosis which occurs in a small proportion of children. The book is a good example of the best kind of public health propaganda which imparts knowledge simply without sensational detail.

INTERNATIONAL LEAGUE AGAINST TRACHOMA.

THE International Anti-Trachoma League, the foundation of which was planned last year at the International Ophthalmological Congress held in Amsterdam, has now taken shape. A meeting took place last month in the Palace of the League of Nations in Geneva, 21 different States being represented by 40 delegates. Prof. Dr. Emil de Grósz presided, the statutes were passed, an executive committee was formed, and a preliminary programme for the campaign was outlined. The objects of the League are: to further the coöperation of the various organisations for the prevention of trachoma; to enlist the help of the international bodies concerned with public health; to keep in touch with all measures designed to combat the spread of trachoma and to further their adoption; to attempt to place the campaign on a scientific basis; to elucidate the ætiology as well as to extend the treatment of the disease; to investigate its social aspects, and finally to formulate legislative measures designed to prevent it. Prof. de Grósz was elected president of the League, to hold office for five years; Dr. Wibaut (Amsterdam), secretary-general; Dr. Tewfik (Cairo), secretary. The representatives of the Hygiene Committee of the League of Nations, Mr. Lutrario, former chief of the Italian Medical Department, and Mr. Jitta, chairman of the Dutch Board of Health, have prepared a report on trachoma which has been distributed by the Council of the League of Nations. Dr. Olitsky (New York) attended the meeting at Geneva on behalf of the Rockefeller Institute, and delivered an address on the importance of the bacillus discovered by the late Dr. Noguchi, and Mr. Addario (Palermo) and Mr. M. S. Mayou (London) gave demonstrations. The delegates from the different nations evidently welcomed the opportunity of discussing common and complementary problems, and everything points to the likelihood of the League becoming a prosperous and useful undertaking. The countries which are obliged by their geographical position to take steps to prevent the introduction of trachoma are in the same need of a campaign against it as those where it is actually destroying eyesight. In Hungary the campaign against the disease was started as long ago as 1886 by the passing of a special law. The exertions of Japan in this respect are also worthy of praise, for there exist in that country 1000 trachoma departments where half a million trachoma patients are treated annually by specialists at a cost of half a million yen a year. The League of Nations has issued a special circular letter to all Governments requesting them to support the scheme, and we trust that the response will be good.

[3] Was sollte der Laie von der Kinder-Tuberkulose wissen? Kurze Mahnworte. Leipzig: Curt Kabitzsch. Pp. 16. M.0,60

MILK-BORNE EPIDEMICS.

THE epidemic of sore-throat which occurred in Brighton and Hove in November–December, 1929, and was traced to milk is the subject of comment by Dr. D. Forbes in his annual report, which we notice on p. 371. He gives two reasons why some time elapsed before milk was suspected in this outbreak. One is that while epidemics of scarlet fever and diphtheria due to milk are frequently reported, outbreaks of other forms of sore-throat have only occasionally been traced to milk in this country. Secondly, the practitioners thought that they had to do with a special type of influenza focusing itself upon the pharynx; such types of sore-throat are not notifiable. Dr. Forbes makes some suggestion which, if adopted, might prove helpful in detecting sore-throats due to milk. The first is to empower the medical officer of health to ascertain the source of the milk-supply promptly in cases of sore-throat which are not notifiable. In Brighton, for example, some 24 swabs from suspicious throats are received weekly, of which 21 give negative results for diphtheria bacilli. Dr. Forbes proposes, and the local division of the B.M.A. concurs, that every practitioner who sends a swab for examination should fill in on the accompanying slip the source of the milk-supply. The arrival of a number of slips quoting a particular milk-supply would arouse suspicion at an early stage of an outbreak. A second suggestion is made that the model form of contract between producers of milk and distributors should include a clause requiring the producers to notify to the distributor not only the legally notifiable diseases but also any type of sore-throat or diarrhœa occurring in the families of his employees. This suggestion has been approved by the Home Counties Branch of the National Federation of Dairymen's Associations. The Brighton Health Committee have asked the Ministry of Health to make regulations, if possible, rendering this form of notification by the milk producer compulsory. In the third place Dr. Forbes points out that, in his view, pasteurised milk is the only designated milk which gives protection to the consumers against such outbreaks. He adds that one-third of Brighton's milk-supply is now pasteurised, although only a portion of it is sold as designated milk.

Critics might say that if pasteurised milk is not sold as designated milk there is no control of the

[1] See THE LANCET, 1930, i., 94, 99, 213.

method adopted or of its adequacy; and also that since adequate pasteurisation can only protect against infection of the milk before the time of pasteurisation, the possibility of infection by the distributing agency has still to be reckoned with. Infection of the milk has often been traced to the distributing dairy as distinct from the producing dairy farm. It might be contended that dried milk is safer even than pasteurised from this point of view, but milk-borne epidemics are so rare that public opinion would hardly contemplate the abolition of liquid milk on this ground. If precautions such as notification of milk-supply were adopted the risk to the householder would be very small, and he could, if he wished, reduce it still further by adopting, as an alternative, an adequate form of home pasteurisation or the west country method of setting up the milk for clotted cream.

THE LEGALISATION OF EUGENIC STERILISATION.

THE promotion of legislation to permit the sterilisation of such persons as should be prevented, in the interests of the community, from reproducing their kind, is one of the objects of the Eugenics Society. The society appointed a special committee to further this object and the report of the committee is summarised in another part of this issue (p. 369). That legislation is necessary is hardly in doubt, for so eminent an authority on the common law as Mr. Justice Humphreys has stated that, no matter how admirable the motives of surgeon, parent or guardian, the surgeon who operated would certainly be indictable under the Offences against the Person Act, 1861, and the parent or guardian under the Mental Deficiency Act, 1913. Even voluntary sterilisation is stated by Lord Riddell probably to constitute a maim, an old term for a serious injury likely to interfere with fighting power; castration has always been considered a very serious maim, for it is believed to reduce the courage of the person on whom it is practised. The committee outline the provisions of the Bill which they intend to draft; the sterilisation which they propose to legalise would in all cases be voluntary, except that a defective of such a low grade as to be unable to give consent might be sterilised with the consent of his relatives on discharge from an institution. The Bill is to be divided into three clauses or parts, dealing respectively with mental defectives, the recovered insane, and persons suffering from grave transmissible diseases and defects other than insanity and mental defect, and—what many will consider a very advanced provision—those desiring to avoid procreation on eugenic grounds. The arguments of the advocates of sterilisation cannot be dismissed without careful consideration. As the report points out, it is no part of the proposals that the policy of segregation should be in the least relaxed. Although R. A. Fisher calculates that, if all primary aments were prevented forthwith from breeding, the incidence of mental deficiency would be reduced by 17 per cent. in a single generation, other authorities think that in practice sterilisation would not have much appreciable effect for a far longer period. An argument harder to counter is that it would do a certain definite amount of undeniable good without any harm that can be convincingly demonstrated. It is accepted as fact that defectives very often have defective children and that as a class they fail lamentably in managing their homes and bringing up their offspring. It is difficult to see how, in the absence of proved harm, the community could lose by their sterilisation; the tendency to neuropathic disorder is known to be transmissible, and it is not unreasonable to aim that as little should be transmitted as possible. The chief argument against the sterilisation of defectives so low in intelligence that they are unable to give consent is based on the desirability of safeguarding the natural rights of the individual, however little gifted. But it must be remembered that in some cases liberty of movement, which the community would otherwise insist on curtailing, could be exchanged for liberty of procreation. The case against sterilisation rests essentially less, perhaps, on the desire to protect the individual than upon a very old concept which concerns the welfare of the State—viz., that no one, even by his own consent, should be allowed to undergo an injury that would depreciate his value to the State as a fighting man, or as the procreator of fighting men. It is doubtful whether even castration—and that is not recommended by the advocates of eugenic sterilisation—abolishes courage; the Tawashia of the old Arab and Turkish civilisations were not only good soldiers but good leaders. Even if it be admitted that it is necessary for the State to safeguard the breeding of warriors, the classes whom the committee propose to allow to consent to their own sterilisation are not those from whom such stock can reasonably be expected. It is at least conjecturable that the real objection to sterilisation is rooted far more deeply, in the instinctive fear of mankind of death, either of the individual or of the race. The procreative instinct is the race's most potent weapon against death, and to fetter its freedom appears at first sight to be a dreadful thing. It can be argued, however, that there are few things more really dangerous either to the race or to the individual, than an unfettered instinct, and that indiscriminate multiplication in the community is no less deadly than cancer in the human body. The problem of the mentally unfit is a very urgent one, and the community can only steer the safe middle course by reasoned judgment based on proved fact.

THE HEALTH OF THE ADULT WORKER.

A FALLING mortality, especially in early years, is generally accepted as a sign of successful public health measures. But we may now and again pause to examine the results. A generation resulting from a low infant mortality is now reaching adult years. What connexion, if any, is there between this circumstance and the fact recently stated by the Secretary for War that something like 61 per cent. of those who offer themselves as army recruits have a reduced standard of height, chest measurement, and dental requirement?[1] We read, moreover,[2] that whereas the approximate number of weeks for which sickness and disablement benefits were paid under the National Health Insurance Acts in 1919 was 19 million weeks, it was 25 million weeks in 1925, and 29½ million weeks in 1929, even though since January, 1928, the age at which sickness and disablement benefit is paid was reduced from 70 to 65. In the registration area of the United States mortality in early life has been falling, as in this country, but now a new phenomenon has appeared over there—for all ages after 35 the mortality in 1927 had risen as compared with 1921. We seem, then, to be faced with a greater need

[1] THE LANCET, August 9th, p. 318.
[2] Ibid., p. 319.

than heretofore for safeguarding the adult years of life

The report of the Factory Department [3] gives an indication of the position among industrial workers, and of the efforts made to combat adverse influences on their health. In the section on the occurrence of accidents, which represent the reaction of the individual to his environment, we find that, as usual, 80 per cent. were due to causes such as falls, struck by falling body, handling goods, and use of hand tools; all of which are causes under personal control, more likely to be avoided by those whose special senses are acute and whose reactions are brisk. Only 20 per cent. were caused by moving machinery; and even here lack of personal acuity is often the determining factor. The number of reported accidents rose from 154,319 in 1928 to 161,269 in 1929; and fatalities from 953 in 1928 to 982 in 1929. Here, again, evidence seems to indicate that human adult material is less resistant than heretofore, and less capable of meeting the hazards of life. This rise in the occurrence of accidents is the more disappointing in that a steady campaign to spread safety-first methods is being pressed forward by the factory inspectorate. A further disquieting fact is that sepsis occurred in 10 per cent. of the reported cases; since some of these were strains and sprains which would not be associated with any wound, the proportion of wounds which went septic is even higher than this figure suggests. The reason may be neglect to make adequate use of first-aid appliances, but may also suggest lack of good capacity for healing. Examples are quoted to show how well-planned efforts may reduce accidents, in one case a frequency-rate from 85·6 in 1927 to 67·7 in 1929, and a severity-rate from 2·2 to 1·7. Education and organisation are indeed needed. One fatality was due to walking on an 18-inch steel girder at a height of 75 feet from the ground; the man was reading a plan and, not watching his steps, walked off the end of the girder. Many instances of carelessness are quoted, resulting in electrical accidents; but here, while the hazard, as measured by units of energy sold, has doubled during the six years ended 1928, the accidents have only increased by 8½ per cent.—a commendable result due to practical regulations controlling the methods of supply and the apparatus used. A warning is given that the alternating system, adopted by the Electricity Commissioners for general use, is more dangerous to life than the direct current system.

Much of medical interest is described by Dr. J. C. Bridge, whose report deals increasingly with wider aspects of health and disease, while comparatively less space is devoted to old-time favourites, like lead poisoning and anthrax. Cases of lead poisoning only numbered 169 for the 12 months compared with 242 in 1926, 505 in 1910, and 1059 in 1900. This result has followed suppression of dust containing lead salts; indeed as Dr. Bridge says, this is the "dust age" in industrial medicine. Silicosis, due to inhaling silica dust, is to-day the most prominent industrial disease, the full prevalence of which, as revealed by recently granted compensation, is not yet known. A new disease, due to the dust of asbestos, has been detected, causing diffuse pulmonary fibrosis, disablement, and death without a superadded tuberculous infection. Of almost equal importance are the cases of epitheliomatous ulceration of occupational origin, arising from contact with pitch, tar, paraffin, or mineral oil, all distillation products of coal; they showed a slight reduction on the previous year, 165 with 50 deaths, as compared with 175 with 59 deaths. Here the institution of periodic medical examination in the industries concerned is bringing the risk under control. A closely allied trouble is that of dermatitis, which shows no tendency to diminish, while painters claimed an increased proportion, 10·3 per cent. of the cases, due probably to the use of turpentine to clean their hands and arms. Chromic acid and chromium compounds, used in lithographic processes, were sources of skin irritation; as were cutting lubricants and cooling liquids used in engineering. The use of an alkaline wash, such as chlorinated soda, is recommended for removing oil and grease after work. Many other matters of interest are noted, including a satisfactory increase in the number of workers with knowledge of first-aid, and in the provision of ambulance rooms, as well as special reference to cases of gassing. Here carbon monoxide continues to claim more cases and deaths than all other gases taken together; generally the cases are tragic, and could have been prevented. One man, overcome at some simple job, jeopardises the lives of others who attempt rescue with courage, but without application of proper principles.

The report leaves the impression that the industrial worker, as well as industry, is in these days depressed.

[3] Annual Report of the Chief Inspector of Factories and Workshops for 1929. 1930. H.M. Stationery Office. Cmd. 3633. Pp. 173. 2s. 6d.

AN OFFICIAL CORRECTION FROM THE M.R.C.

WE have been desired by the Medical Research Council to publish the following official statement from the Council.

The attention of the Medical Research Council (Great Britain) has been drawn to a misleading advertisement, involving misuse of their name, which has been given currency on the American Continent in respect of a preparation of ergotamine tartrate known as Gynergen "Sandoz." This advertisement states that "The Pharmaceutical Society of Great Britain, after consultation with the Medical Research Council, adopted Gynergen as the standard for ergot, thus making it the acknowledged leader in this field." This statement is not true.

The Medical Research Council desire to make it plain that they never at any time concurred in, or were consulted about, the adoption of this preparation as a standard. The suggestion made with reference to the Council is therefore entirely without foundation, and any statement implying their approval is a gross misrepresentation.

Further, the current official publications of the Pharmaceutical Society of Great Britain state expressly that for ergot "the standard is a sample of ergotoxine phosphate which is kept in the dark *in vacuo* over phosphorus pentoxide." The adoption by the Society of this standard, in place of a sample of ergotamine tartrate, was also announced three years ago in a paper by Burn and Ellis (*Pharmaceutical Journal*, 1927, cxviii., 384), which constituted a report to the Chairman of the International Conference on the Biological Standardisation of Certain Remedies.

CONGRESS FOR SEX RESEARCH.

THE Second International Congress for Sex Research was held at the B.M.A. House from August 3rd to 9th. Over 200 members attended, and many countries were represented. Prof. F. A. E. Crew presided over the congress; Dr. Albert Moll, president of the International Society for Sex Research, was the only vice-president; Mr. B. P. Wiesner, Ph.D., acted as general secretary, and Mr. A. W. Greenwood, Ph.D., as publications secretary. Ten medical men served, among others, on the British organising committee, which arranged an admirably varied programme. The subject of the presidential address was Puberty and Maturity, and the subjects dealt with at the general session on August 5th included communications by Prof. Paul Bouin and Dr. J. Benoit (Strasbourg) and by Prof. H. C. Koch (Chicago) on the testicular

hormone, and by Prof. J. B. Collip (Montreal) on the ovary-stimulating substance of the placenta. On the following days the general sessions were devoted to papers and discussions on the influence of hormone therapy on sexual functions, opened by Prof. L. Fraenkel and Dr. E. Fels (Breslau); psycho-analysis and biology, opened by Dr. Ernest Jones (London); transformation of the sexual into the maternal instinct, opened by Prof. Carlo Ceni (Bologna), and the methods for the control of human fertility. The afternoons were mostly devoted to sectional meetings at which over 100 short communications were submitted on diverse subjects, ranging from biochemical studies of the sex hormones to special forms of sadism. On August 6th an excursion was organised to Cambridge, where at the School of Agriculture demonstrations were given by workers at this school and also by the Animal Genetics Department of the University of Edinburgh, and by the Strangeways Research Laboratories, Cambridge.

MEDICAL INSURANCE AGENCY.

A MEETING of the committee of management of the Medical Insurance Agency was held at the House of the British Medical Association on July 29th, when the report of the twenty-third year of the agency's work and the corresponding balance sheet were adopted. It was revealed in the report that the general progress of previous years had satisfactorily continued, an outstanding feature being the successful opening of the office in Scotland. The total premium income for the year approximated £98,000—an increase of more than £8000 as compared with the previous year—while 6500 renewals had to be dealt with. The commission from motor-car insurance continued to increase rapidly. Life assurance dealt with through the agency approximated during the year to two million pounds. The following grants were made to organised medical charities for 1930:—

		£	s.	d.
Royal Medical Benevolent Fund	..	630	0	0
Royal Medical Benevolent Fund Guild	..	630	0	0
Epsom College—				
Dawson Williams Memorial Fund	£650			
Royal Medical Foundation ..	£210			
Head Master's Discretionary Fund	£100			
		960	0	0
Girls' Education Fund	..	250	0	0
Royal Home for Incurables, Putney	..	52	10	0
Sir Charles Hastings Fund ..	..	52	10	0
Royal Medical Benevolent Fund (Ireland)		25	0	0
		£2600	0	0

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE annual meeting of the British Association, to be held at Bristol from Sept. 3rd to 10th, promises well. The sciences will be divided, as usual, into sections, of which this year 13 will meet concurrently in different rooms. The programme submitted is chronological, all sections being included, so that any member who gives it the study it deserves can pick out those communications likely to interest him and make plans to visit several sections on any day. Prof. F. O. Bower, F.R.S., Emeritus professor of botany (Glasgow), is this year's president and will deliver his address on Size and Form in Plants at the inaugural general meeting at Colston Hall on Sept. 4th. We have already called attention to certain notable addresses and discussions, which should yield a rich harvest, and would now stress the importance of many of the communications offered to Section J (Psychology). On the opening day of the meeting a discussion will be held on the Psychology of Adolescence, to which Prof. Olive Wheeler, Dr. R. G. Gordon, Miss A. H. McAllister, and Miss M. Phillips will contribute. On Sept. 5th Prof. C. W. Valentine (Birmingham) will deliver his presidential address on the Foundations of Child Psychology, and in the afternoon the shorter communications to the section will include a survey of the Place of Industrial Psychology in a University City, by Dr. C. S. Myers, F.R.S. Section J joins with Section I (Physiology) on Sept. 8th, when Mr. J. Drever, D.Phil., Prof. H. E. Roaf, Dr. R. J. Lythgoe, and Mr. J. H. Shaxby, D.Sc., will discuss the question, "In what sense can we speak of primary colours?" Other interesting papers to be read at this section include two on conditioned reflexes from the psychological point of view, by Dr. P. C. P. Cloake, and Dr. A. Wohlgemuth respectively; one on perseveration and the introvert, by Dr. W. J. Pinard; one on the psychophysics of desire, by Mr. C. A. Mace; and one on the psychology of the tuberculous patient, by Dr. H. Banister. A closer union between the ideas of those engaged in medical practice and those engaged in psychological research is one of the outstanding needs of the present time, and doctors who are members of the British Association should follow closely the activities of this section.

ON the passing of the Mental Treatment Act the Board of Control, with the approval of the Minister of Health, have appointed Mr. P. Barter (of the Ministry of Health) to be joint secretary of the Board. Mr. Barter was secretary to the Committee on Asylum Administration, 1921–22; the Royal Commission on Lunacy and Mental Disorder, 1924–26; and the Royal Commission on Local Government, 1928–29.

THE Royal College of Physicians of London will be closed for the summer vacation from Monday, August 18th, to Saturday, Sept. 20th, both days inclusive. In our advertisement columns application is invited for the office of Milroy lecturer for 1932. The course consists of three lectures on State medicine and public hygiene; suggestions for the choice of subject were left by Dr. Milroy in his will, and are at the disposal of applicants.

AN additional coroner, to be appointed for the County of London at a salary of £1700, will probably be allocated to the new northern division of the County.

Prof. G. Grey Turner has been invited to deliver the John B. Murphy Oration before the Clinical Congress of the American College of Surgeons in Philadelphia on Oct. 13th.

WE regret to announce the death in Belfast of Dr. John Elder MacIlwaine, professor of materia medica and therapeutics at the Queen's University and visiting physician to the Royal Victoria Hospital. He was in his fifty-seventh year.

BELFORD HOSPITAL.—The Duke of York, as Earl of Inverness, recently opened a new operating theatre at the Belford Hospital, Lochaber, Inverness-shire, as a memorial to Dr. Cameron Miller, who was medical superintendent for 41 years until his death in 1927.

CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS

A Series of Special Articles, contributed by invitation.

LXXXI.—THE CLINICAL SIGNIFICANCE OF SLIT-LAMP APPEARANCES.

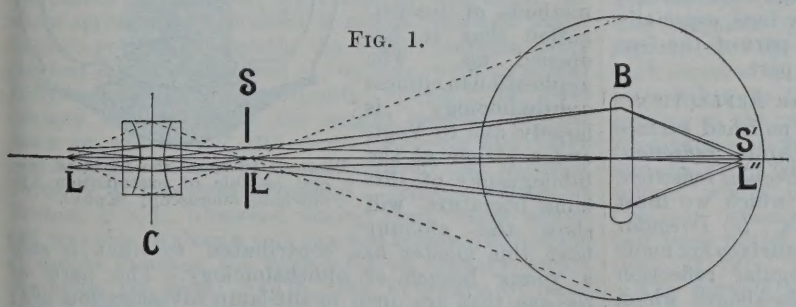
PART I.*

THE introduction of the binocular corneal microscope many years ago raised the hopes of the ophthalmic surgeon, in that it promised to be an instrument which, capable of 60–100 magnifications, might prove of great help in diagnosing conditions of the cornea and iris which were not visible with the ordinary corneal loupe of 8 to 10 magnifications. The result was that apart from a few observations of interest, especially in the lens by Hess, there followed very little increase in our knowledge.

In 1911 Gullstrand showed at the International Ophthalmological Congress at Heidelberg an entirely novel method of illuminating the anterior segment of the eye, which enabled the observer to see peculiarities in the structure of the vitreous and lens, even with quite low magnifications. The best results were obtained when there was a perfect control of the distribution of light and shadow. The essential point was to obtain a sharp image of a bright and uniform source of light, so beautifully focused that it might be projected upon that portion of the eye which we wished to examine and all other light shut out from the field. The examination had to be conducted, therefore, in a dark room, and various reflexes, from the highly polished refracting surfaces of the eye, excluded. The aim was to obtain first of all a sharply limited uniform source of light of high specific intensity, and secondly a sharp optical image of this source.

In the past we sought a uniform source of light for ophthalmoscopic examination, and this was obtained by using, in earlier days, the Argand gas burner or duplex petroleum lamp and in more recent days the frosted electric lamp with a closely wound filament. Neither of these sources of illumination was suitable because neither was of high intensity, neither were they at all uniform.

FIG. 1.

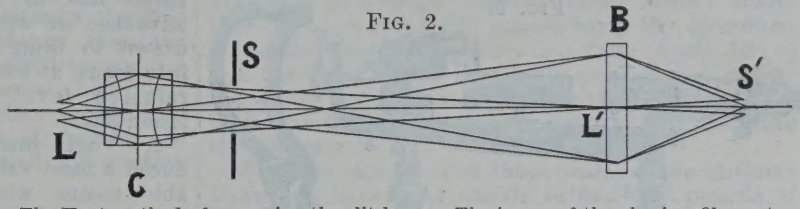


The Gullstrand method of arranging the slit-lamp. The image of the glowing filament (L) is formed in the slit (S L′) which is then focused upon the eye (S′L″) by means of the illuminating lens (B) (Meesman).

At the date of the invention of the slit-lamp there were only two sources of light (apart from sunlight) which were uniform—namely, the crater of the positive carbon of an arc lamp and the glowing filament of a Nernst burner. The arc lamp was so cumbrous at that date that its use was not practicable, consequently Gullstrand chose the Nernst lamp as his source of light. As the image of the source of light had to be used with a diaphragm, this diaphragm, made to enclose the image of the glowing filament, had necessarily to be shaped as a slit, and it was for this reason that the illuminating lamp was equipped with a slit.

The complete illuminating apparatus consists of the glowing filament enclosed in a tube at the other end of which is a slit of variable width. Between the two is a condensing system whereby an image of the glowing filament is projected in the slit. An image of the image of the glowing filament in the slit is projected upon the portion of the eye to be examined with an aspherical lens. (Fig. 1.) It is not possible to obtain Nernst lamps now and consequently some other source of illumination had to be devised, and so the Nernst lamp has been replaced by the Nitra lamp which consists of a tightly wound glowing spiral of tungsten in an atmosphere of nitrogen. The disadvantages of such a lamp are that the spiral does not produce a uniform source of light, it is seldom straight, and the glass globe deteriorates the optical image projected in the slit.

FIG. 2.



The Vogt method of arranging the slit-lamp. The image of the glowing filament (L) is formed on the illuminating lens (B). The image (S′) of the slit (S), filled with homogeneous light, is focused by the illuminating lens (B) upon the eye (Meesman).

The lens (the illuminating lens) which projects the image of the glowing filament in the slit upon the eye is fixed upon an arm which projects from the tube of the illuminating system (the arm of Henker). It is found that if the image of the filament itself be projected upon the illuminating lens then the slit acts merely as a diaphragm filled with homogeneous light, an image of which may be projected upon the eye by the illuminating lens. This method, known as that of Vogt, is the one usually adopted, and the aspherical illuminating lens is replaced by an achromatic lens severely diaphragmed (11 by 16 mm.) and having a focal length of 10 or 7 mm. (Fig. 2.) This prevents the light from being broken up and, having a small diaphragm, no trouble arises from spherical aberration.

The complete apparatus now consists of a luminous source, a condenser, a slit, and at the end of Henker's arm, which is 35 cm. in length, an achromatic lens of 10 to 7 cm. focal length. This apparatus is mounted on an arm attached to the pillar of a suitable table to which also is attached a chin and head rest for the use of the patient. In this way the head is immobilised, and the light can then be practically focused upon the portion of the eye we wish to examine. We use in connexion with this illuminating the Czapski binocular microscope, which has long been in use, but with only medium amounts of magnification, seldom more than 23 diameters. The microscope has an erecting mechanism in the eyepiece so that we observe upright images, a matter of great convenience. In connexion with the screw of the focusing arrangement is a device for measuring the depth of the anterior chamber. (Fig. 3.)

Methods of Examination.

It must not be imagined that the slit-lamp and microscope are together merely a piece of apparatus for practising a superior type of focal examination.

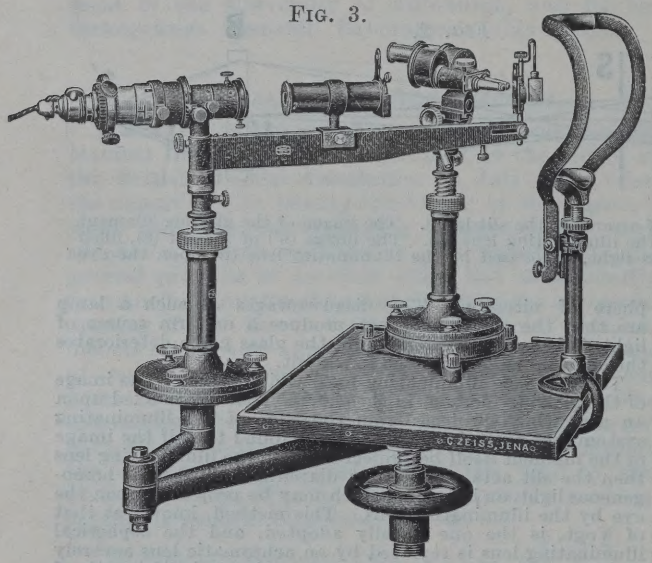
* Parts II. and III. will appear in subsequent issues.

It is true that this is one of its special functions, but owing to the peculiar transparent property of the parts of the eye open to investigation several other new methods of examination are open to us.

Examination in *focal light* is the easiest as well as the most useful method, and owing to the intensity of the illumination small opacities in otherwise what appear to be perfectly transparent structures may be exhibited by the principle of dark-ground illumination.

One new method is that of examination by *trans-illumination*. For this it is necessary that the structure to be examined should be transparent or at least translucent; it is also necessary that there should lie behind it a surface of sufficient polish to act as a reflecting or diffusing screen. Thus, to examine the cornea in this way we concentrate the light upon the portions of the iris or lens which lie behind it and certain changes in the endo- and

FIG. 3.



Gullstrand slit-lamp with Nitra lamp. The component parts—lamp, Koeppe tube, and illuminating lens—are mounted on the arm of Henker. The method fixing the apparatus to the table is shown, also the head and chin rest. The microscope may easily be moved into a desired position by sliding it over the glass plate.

epithelium are made much more apparent. The iris, if translucent by disease or injury, may be examined by light reflected by the surface of the lens, especially if it be cataractous, and the anterior part of the lens by light reflected by the posterior part.

EXAMINATION IN ZONES OF SPECULAR REFLECTION.

When light strikes a more or less polished surface it is reflected in three ways: (*a*) *Diffuse reflection*, whereby we can see the surface. (*b*) *Regular reflection*, whereby images are formed, to see which we must be in the path of direct reflection of rays. (*c*) *Irregular reflection*, whereby irregularities of the surface are made apparent. A good example of irregular reflection is shown by the glint seen on a blackboard which prevents one seeing the writing in the zone. If the position of the head be shifted then the glint will appear in another part of the board obliterating the writing here, whereas the writing in the previously obscured area will reappear. If attention be paid to each of the zones the irregularities of the surface, such as the grain of the wood or the marks of the brush, will be seen, and in this area alone. This peculiar phenomenon was first investigated by Vogt, and by its means the endothelium of the cornea may be seen with no more than 23 magnifications, and in some instances the nucleus of the cell may be seen.

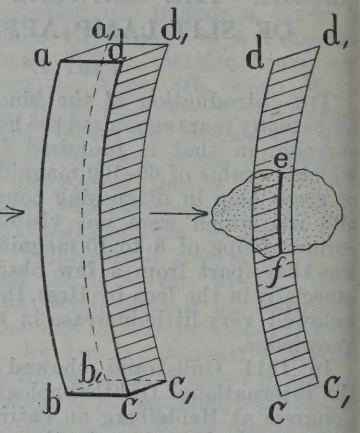
LOCALISATION IN DEPTH.

A most important advance in our means of investigating the translucent part of the eye is the means we now possess of deciding at what depth a lesion lies. This is one of the important functions of the slit-lamp and microscope. The two most important means available are:—

1. By *focusing the microscope* we may judge by the amount the microscope has to be advanced or withdrawn to bring it into focus, at what relative level a lesion lies.

2. Vogt introduced a most valuable means when he described the method of the *optical section*.

FIG. 4.



Localisation in depth by means of the corneal prism: (a b c d) = anterior band, (a,b,c,d,) = posterior band, (d c c,d,) = the optical section. If the slit be very much reduced in width the optical section becomes extremely thin, and by its means the depth of a lesion in the cornea or lens may be determined (Meesman).

The media of the eye are in no instance perfectly transparent and when the ribbon of light projected by the illuminating lens passes through them the path of the rays is easily visible, like a beam of light shining through an otherwise darkened room. Taking the cornea as our example, a parallelogram of light will be reflected by the anterior surface to the cornea and a corresponding one at the posterior surface, the intervening part scattering light so as to render the thickness of the cornea visible. The lateral face of the beam as it shines through the cornea is called the *optical section*, and if the slit be very much narrowed we may produce an illuminated layer of the cornea not more than 50 μ in thickness. (Fig. 4.) By judging what portion of the optical section first illuminates a lesion or foreign body we are able to decide at what depth it lies. The optical section is of importance in examining the lens and we shall see that here some remarkable discoveries have been made.

This brief account gives some idea of the origin of the slit-lamp and the methods of investigation that it has opened up. The application to clinical ophthalmology is largely due to Vogt, and a glance at the bibliography of slit-lamp literature will show the amount that this master has contributed to what is still a young branch of ophthalmology. The parts of the eye that are open to slit-lamp investigation are: (1) conjunctiva; (2) cornea; (3) anterior chamber; (4) lens; (5) anterior third of vitreous. (Fig. 5.) Taking these structures in order we shall see how the slit-lamp has revealed many new points of normal appearance, has elucidated points in diseased conditions about which we had already some information; but its chief value has been to allow earlier diagnosis as well as to point out entirely new conditions.

FIG. 5.

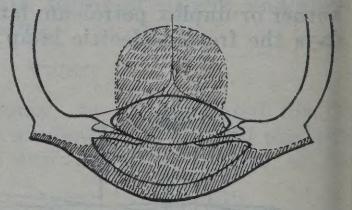


Diagram to show the parts of the eye capable of examination by slit-lamp microscopy (Koby).

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SPECIAL ARTICLES

A REPORT ON SEASONAL VARIATION IN THE GROWTH OF SCHOOL-CHILDREN.*

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AND
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DURING the investigation on the effect of milk on the growth of school-children, already reported in this journal,[1 2] there was evidence that the increase in height and weight of the children was not distributed evenly throughout the period of the test. To obtain further information on what appeared to be a seasonal variation in the rate of growth, the periodic measurements were continued for another year.

Previous Work.

To Malling-Hansen [3] we are indebted for the first accurately recorded observations on seasonal growth in height and weight, though Buffon [4] had suspected that summer and winter growth in height in children might not proceed at an equal rate. In the children of a deaf and dumb institution in Copenhagen, Malling-Hansen, from painstaking daily observations extending over three years, found three main periods of growth (excluding the summer vacation weeks). These were:—

PERIOD.	HEIGHT.	WEIGHT.
Minimum ..	Mid Sept. to end Nov.	End April to mid July.
Medium ..	End Nov. to end March.	Mid Dec. to end April.
Maximum ..	End March to end June.	Mid Sept. to mid Dec.

He also noted that the greatest weight increase was during and just immediately after the summer holiday, while there might even be loss of weight in the period from April to July. Camerer,[5] on a few German children observed for several years, also noted seasonal differences in growth, with loss of weight in the warm spring days. Schmid-Monnard [6] likewise found distinct periods in growth, the weight increase being greatest in the second half of the year, with an actual decrease occurring in March. Bleyer,[7] in 1000 German infants, found the weight increase to slow down in winter and still more in spring and early summer, but to hasten in late summer and autumn. Porter,[8] in "several thousand" school-children in Boston, U.S.A., observed during their whole school life, was able to show a very marked seasonal difference in weight increase, the September to January period averaging (in boys) 3·40 lb., the February to June period 0·82 lb. He also found loss of weight in April, May, and June. Gebhart,[9] with Italian children in New York, showed a spurt of weight in autumn and arrest (but not loss) in spring. Frank [10] found a seasonal difference in height increase even in infants from birth up to two years; a rapid rise from April to June, slowing down in the hot summer months and still more in the winter months. v. Wendt,[11] on 15,000 children in Finland aged from 11 to 16 years, found a maximum increase in height from June to September, in weight from October to January; a minimum in both height and weight from February to May. Emerson,[12] on the contrary, from records of over 800 children in such different centres as Honolulu, Toronto, and New York, could find no difference in the rate of increase in height throughout the year, nor any correlation between the rate of increase in weight and the sunshine record in each city. He considers fluctuations in weight most probably due to infections and hygienic conditions, not to biologic reasons. Corry Mann [13] found that, in a group of 220 school boys, the increment in height during summer—i.e., from April 1st to Oct. 1st—was almost invariably greater than during the winter period from Oct. 1st to April 1st, and that there was also usually a greater gain in weight during the summer.

With the exception of these observations of Corry Mann, we have been unable to find any records of seasonal differences in growth of children in Scotland or England. The following observations, though on rather small numbers (657), are offered as a contribution to the existing data on this subject.

Present Investigation.

The children on whom the observations were made were attending public day schools in Glasgow, Edinburgh, Dundee, Peterhead, and Greenock.

METHOD.

The measurements were taken in the second and third weeks of December, 1928, March, June, September, and December, 1929. The children measured were from 7 to 11 years of age. They had received no supplementary feeding since June, 1928, and were therefore on their ordinary home diets.

All the measurements were taken by one observer, the centres visited in the same rotation, and children weighed and measured at the same time of day on each occasion, without shoes, but with indoor clothing. The average weight of clothing at each weighing was computed by the method described in the previous report,[1] and the difference allowed for in calculating each increase in weight of the children. The weights were taken to the nearest quarter of a pound, the heights to the nearest eighth of an inch. With these precautions it was hoped to ensure accurate records and to avoid the daily fluctuations in height and weight which previous observers (Malling-Hansen, Camerer, among others) had recorded, and which had been noted in the Scottish children in the milk tests (1), (2).

The periods were: (1) From December, 1928, to March, 1929. (2) From April, 1929, to June, 1929. (3) From July, 1929, to September, 1929. (4) From October, 1929, to December, 1929.

In the case of children who had suffered any serious illness the data were omitted from the records. The data for the Greenock children were also omitted, owing to the fact that the machine on which the weighings and measurings were done was changed after the first observations, and there was some doubt about the accuracy of the yardstick on the first machine which was not checked. The data were calculated separately, and though the results do not

* Part of the expenses of this Survey was defrayed by a grant made to the Department of Health for Scotland by the Empire Marketing Board. The Nutrition Committee of the Medical Research Council were kept informed of the progress of both this and the previous investigation on the effect of milk on school-children, and acknowledgment is made for the helpful advice and criticisms obtained from the Committee, who are, however, not in any way responsible for the accuracy of the data or views expressed.

differ materially from those recorded from the other four centres, owing to the element of doubt as to their accuracy, it was necessary to omit them.

RESULTS.

The cards used were first of all divided into age-groups for each sex, irrespective of centre, and the mean increase in height and weight during each period were calculated. The results are given in Table I.

TABLE I.—*Height: Mean Increase in Inches.*

Age in years.	Number.	Period— I. (Dec.–March).	II. (April–June).	III. (July–Sept.).	IV. (Oct.–Dec.).
		Boys.			
7	59	0·4301	0·8518	0·5357	0·3773
8	40	0·4969	0·7535	0·5031	0·3081
9	26	0·4952	0·7396	0·4243	0·3542
10	111	0·4189	0·6898	0·5172	0·3010
11	70	0·3893	0·6848	0·4729	0·3114
		Girls.			
7	68	0·4926	0·7701	0·4909	0·3894
8	52	0·4809	0·7572	0·4828	0·3750
9	25	0·4700	0·7500	0·4375	0·3287
10	139	0·3858	0·7284	0·4991	0·3265
11	67	0·4123	0·7271	0·5438	0·3667

It will be seen that in every case the greatest increase in the year is in the second period (April, May, June); the smallest increase in the last period (October, November, December). In seven out of ten groups the third period (July, August, September) has the second greatest increase; also in seven out of ten groups the first period (January, February, March) has the second lowest increase.

Table II. gives the data for the boys of all ages combined and for the girls of all ages combined.

TABLE II.—*Height: Mean Increase in Inches.*

—	Period— I. (Dec.–March).	II. (April–June).	III. (July–Sept.).	IV. (Oct.–Dec.).
	Boys (all ages).			
Number ..	306	291	275	280
Av. increase	0·4298 ±0·008	0·7309 ±0·008	0·5063 ±0·006	0·3239 ±0·007
S.D.	0·2097	0·1960	0·1455	0·1644
	Girls (all ages).			
Number ..	351	332	328	332
Av. increase	0·4318 ±0·008	0·7417 ±0·008	0·4959 ±0·006	0·3558 ±0·005
S.D.	0·2098	0·2237	0·1616	0·1478

As is seen from Table II., in both sexes the sequence in growth in height is the same; the increase is greatest in the second period, slackens considerably in the third, still more in the fourth, and begins to rise again in the first. When tested statistically, the difference between the increase at any two periods is significant, even in the case of the smallest difference—i.e., between periods I. and III. The period of maximum growth is thus in agreement with that found by Malling-Hansen and Frank in countries with seasons approximately the same.

Table III. gives the data for weight increase separately for the different ages.

The increases in weight do not correspond from age to age so closely as the increases in height. In six groups out of ten the greatest weight increase is at weighing III. (after the summer holiday); in five groups the second greatest increase is made in period IV., the third greatest in period I., and in six groups the smallest in period II.

TABLE III.—*Weight: Mean Increase in Pounds.*

Age in years.	Number	Period. I. (Dec.–March).	II. (April–June).	III. (July–Sept.).	IV. (Oct.–Dec.).
		Boys.			
7	59	1·2670	1·1342	1·3061	1·3046
8	40	1·6000	0·3750	1·4688	1·3546
9	26	0·8750	0·9688	1·5313	1·5937
10	111	1·7387	0·5764	1·8236	1·3835
11	70	1·3286	0·8043	2·0208	1·5682
		Girls.			
7	68	0·8603	1·0936	1·7182	0·8360
8	52	0·9279	1·3413	1·2549	1·2600
9	25	0·5800	1·7174	1·6250	1·7500
10	139	1·0665	1·0213	1·9421	1·3358
11	67	1·3023	1·2083	2·2083	1·4084

Table IV. gives the data for the boys of all ages combined and for the girls of all ages combined.

In both sexes much the greatest increase in weight is made in the period that includes the summer holiday; the difference between this increase and that of any other period is statistically significant. The boys make in the first period an increase slightly, but not significantly, greater than the fourth period; the girls in the fourth period an increase significantly greater than that of the first period but not than that of the second. The small increase made by the boys in the second period is remarkable. Questions at the June weighing brought out the fact that many children, and more particularly the boys, were practising for school sports.

TABLE IV.—*Weight: Mean Increase in Pounds.*

—	Period— I. (Dec.–March).	II. (April–June).	III. (July–Sept.).	IV. (Oct.–Dec.).
	Boys (all ages).			
Number ..	306	291	275	280
Av. increase	1·4677 ±0·048	0·7423 ±0·049	1·7070 ±0·051	1·3741 ±0·050
S.D.	1·2609	1·2463	1·2582	1·2551
	Girls (all ages).			
Number ..	351	332	328	332
Av. increase	1·0149 ±0·048	1·1674 ±0·045	1·8268 ±0·048	1·2808 ±0·049
S.D.	1·3467	1·2199	1·2943	1·3230

The cards were scrutinised as to numbers showing no gain or definite loss of weight in the different periods with the following results:—

Period.	*Boys.* Per cent.	*Girls.* Per cent.
I. (Dec.–March)	12·4	22·7
II. (April–June)	23·2	16·8
III. (July–Sept.)	6·5	4·7
IV. (Oct.–Dec.)	12·5	16·5

HEIGHT AND WEIGHT PERIODS COMPARED.

On comparing Tables II. and IV. it is seen that the period of greatest increase in height is not that of greatest increase in weight, nor that of least increase in height that of least increase in weight. Quite definitely the greatest weight increase is in the period following the greatest height increase, as is seen in the

graph. Dividing the increase into two periods, instead of into four there is a very decided difference, in both sexes, in both height and weight.

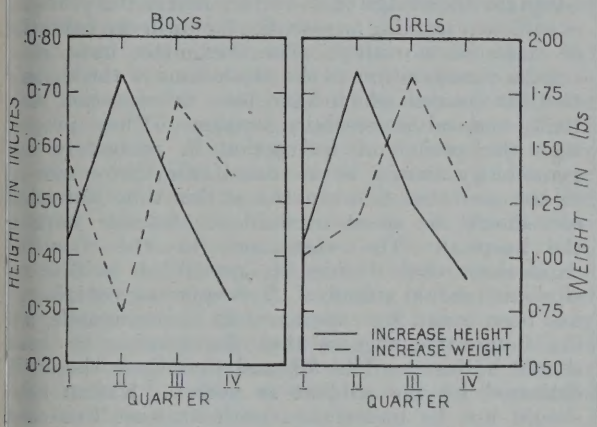
HEIGHT INCREASE (INCHES).

	Boys.	*Girls.*
March–September	1·2372	1·2406
September–March	0·7537	0·7876

WEIGHT INCREASE (IN POUNDS).

	Boys.	*Girls.*
June–December	3·0811	3·1076
December–June	2·2100	2·1823

The increase in height from March to September is almost half an inch greater than that from September to March. The increase in weight is nearly one



pound greater in the second half of the year than that in the first half. The periods of increase in height and weight are shown to be not coincident, but subsequent.

Summary.

(1) Children to the number of 657, aged from 7 to 11 years, from four Scottish towns were measured and weighed in quarterly periods. (2) They showed a very much greater increase in height in the three months from the end of March to the end of June than in any other period, and the smallest increase in height in the months of October, November, and December. (3) The weight increase was greatest in the quarter July, August, September; second greatest in the quarter October, November, December. (4) In the early summer quarter (April, May, June) about 25 per cent. of the boys actually lost weight although increasing in height.

Note.—Since this report was drawn up a paper has been published by Gustav Nylin,[14] giving observations on the growth of Swedish school-children. His results show a seasonal variation in growth, the maximum height increase being from March to May. They also show that maximum increase in height is associated with minimum increase in weight. The results are, therefore, in general agreement with those presented above.

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MATERNAL MORTALITY AND MORBIDITY.

INTERIM REPORT OF DEPARTMENTAL COMMITTEE OF THE MINISTRY OF HEALTH.

(*Concluded from p. 324.*)

A National Maternity Service.

IN the eighth chapter of the interim report the history of the gradually increasing interest taken by the State in the provision of an adequate maternity service for the whole nation is outlined. Since 1919 there has been created under the Ministry of Health a maternity service of considerable magnitude, and in 1924 a circular was issued recommending antenatal supervision by the practitioner and midwife, the provision of sufficient maternity beds for abnormal cases by the local authorities, supervision under the Midwives Act of practising midwives, investigation of cases of maternal mortality and morbidity, and the dissemination of educational propaganda to the public. In considering the question of maternity benefit the Royal Commission on National Health Insurance decided that ultimately medical, nursing, and institutional services of all kinds should be administered by the local authorities as a part of the medical service, and that cash benefit should be administered separately from this by the approved societies. In addition, the majority report recommended that as soon as funds became available maternity benefit should be expanded to cover medical and midwifery services as well as cash payment. In 1929 the British Medical Association published a scheme for a national maternity service, and the Departmental Committee on the Training and Employment of Midwives produced a similar scheme. In setting out their recommendations for a national service, the Departmental Committee on Maternal Mortality and Morbidity have had both these schemes under consideration, and it is of interest to note the resemblances and differences between the various schemes.

SCOPE OF THE SERVICE.

In the scheme provided by the British Medical Association as well as in that now formulated by the Committee, the service is designed to apply, not only to insured persons, but to all those not in a position to procure for themselves similar benefits by private arrangement. The service would entail coöperation between the medical profession and practising midwives, probably with representation of both on the committees or subcommittees concerned. The essential points in such a scheme would be the provision of medical antenatal and postnatal supervision, the services of the midwife in every case, and her attendance on normal cases, provision of a consultant when desired by the doctor, and adequate hospital accommodation for those cases which require institutional care. The education of the expectant mother must play an important part in the scheme, since experience shows that neglect of the services available is a potent factor in raising maternal mortality.

POSITION OF THE MIDWIFE.

By the provision of a trained midwife at every labour, whether a doctor is in attendance or not, it is hoped to eliminate the dangerous "handy-woman." The duties of the midwife will be to book the case, to inform the local authorities, to arrange for medical antenatal examinations, to attend the patient during

labour, and to advise her on general hygiene and the value of a postnatal examination. In the British Medical Association scheme it is specially laid down that the midwife should not send the patient to hospital or requisition a consultant on her own responsibility. In order that a sufficient number of well-trained midwives may be available the Departmental Committee, in their scheme, recommend obligatory courses of post-certificate training, and the limitation of the number of cases attended in one year to 100 or 110. They further suggest closer and more helpful supervision, and consider it advisable that eventually all midwives should be drawn from the ranks of State-registered nurses.

POSITION OF THE PRACTITIONER.

The Committee consider that the practical experience of the medical student in midwifery is too meagre and that his work when he is qualified and in practice is often handicapped by adverse economic conditions in the homes of his patients; they therefore recommend adequate payment for obstetric work and better educational facilities. They do not consider that the practice of obstetrics should be limited to a selected panel of practitioners, but that it should be open to the whole profession, as at present. In some areas, however, they think select practitioners working in conjunction with the extern departments of training hospitals might participate in the service, so long as the mother retained her right to a free choice of doctor. The conditions of service for all practitioners would entail the establishment of an advisory medical committee, and the provision of special post-graduate courses in obstetrics. The Committee suggest remuneration by means of an inclusive fee, and differ in this from the British Medical Association, in whose scheme separate fees for antenatal examinations, for confinements, and for postnatal reports are proposed. Another difference arises between the two schemes over the question of antenatal examinations; the Association stipulates that at least one must be made, while the Committee require one at the sixteenth, one at the thirty-second, and one at the thirty-sixth week. In the conduct of postnatal examinations, moreover, the Committee demand a complete investigation of the pelvis and of the general medical condition, while the Association asks merely for a consultation, with examination if necessary. The treatment under the scheme of abnormalities found at the postnatal examination is considered as a probable measure by the Committee. An adequate consultant service is held to be essential under both schemes, the British Medical Association adding a provision that the consultant should usually be obtained locally.

INSTITUTIONAL TREATMENT AND NURSING SERVICES.

The provision of sufficient beds for all abnormal cases and for those normal cases living in unsuitable conditions will be required as part of a complete service; the Association believes that the general practitioner should have the right to follow and attend his patient in hospital, but though the Committee are entirely in sympathy with this principle they feel that the responsibility for the standard of work at any institution should rest in the hands of one person only. The question of sickness benefit for the mother has not yet been considered in detail by the Committee. The possibility that the district nurse might combine midwifery with her general work under the scheme is accepted, provided that the types of sick cases she is attending are suitably restricted; the provision of "home-helps" for the mothers is recognised as desirable. A different fate for the present antenatal clinics is foreshadowed under the two schemes; the Committee see them as centres for consultation between the general practitioner and the obstetrician, while the Association considers that they should develop into centres for training in mothercraft, with the possibility that they might be used in some areas by the general practitioners for the examination of their own cases. The finances of the scheme have not been included in the Committee's report, but have been covered in the scheme put forward by the Association.

Medical Education in Obstetrics.

The importance to the general practitioner of an adequate knowledge of midwifery makes the provision of sufficient training an essential factor in the reduction of maternal mortality. The Committee have given careful consideration to the resolutions of the General Medical Council which have been in operation since 1923, and advise certain revisions. They propose that the period of instruction in midwifery and gynæcology should be increased from three months to six, and that two months of this time instead of one should be spent in resident obstetric work in the hospital. The statement in the Council's regulations that during his period of residence a student "should attend. . . . . twenty cases of labour" has been found by experience to be ambiguous, and the Committee suggest that the number of cases should be increased to 30, and that these should be delivered by the student in person. Extern cases should not be undertaken until at least five cases have been delivered under supervision in the ward. Throughout his six months' training, which should follow six months' work as a surgical dresser, the student should receive systematic instruction in midwifery and gynæcology, so arranged that two-thirds of the time is allotted to midwifery; antenatal work should include the personal examination under supervision of not less than 50 pregnant women, and for instruction in infant hygiene the student should attend at least eight times at an infant welfare centre. Before taking his final examination he should present a certificate stating that these various conditions have been fulfilled, and giving the official position of the certifying officer. Throughout his course the Committee are most anxious that the student should be impressed with the importance of preventive measures in midwifery. The shortage of cases may give the Committee's recommendations the appearance of a counsel of perfection, but they believe that a large number of cases are at present absorbed in training pupil midwives, many of whom do not intend to practise. A redistribution of cases with access, in addition, to the cases confined in council hospitals would, they believe, solve this difficulty.

Anæsthetics in Midwifery.—Puerperal Sepsis.

The Committee consider that light intermittent anæsthesia may be administered to a greater extent than has been the custom up to the present time in normal cases, particularly to primiparæ; such administration should, in their view, be limited to the latter part of the second stage of labour, and should be undertaken by the doctor only. They hold that an increase in the employment of anæsthesia, unless wisely directed and controlled, may lead to an increase in mortality and morbidity. Appendices A, B, and C, which give memoranda on this subject received from the Royal College of Physicians of London, the British College of Obstetricians and Gynæcologists, and the British Medical Association, deserve careful study. The first-named body state

clearly the view that though there are limitations to the wide and general use of sedatives, analgesics, and anæsthetics for the relief of pain in natural labour, if they are administered in hospital under proper medical supervision, the contra-indications are negligible. The British College of Obstetricians and Gynæcologists believe that it would be a simple matter for a fully certificated nurse to receive instruction in the administration of *light* inhalation anæsthesia during her six months' training in an obstetrical hospital or department. They do not think it right for a midwife possessing only the C.M.B. certificate to be entrusted with such a duty, and hold that *deep* inhalation anæsthesia and all other methods of anæsthesia should be administered only by a qualified medical practitioner.

Among the recommendations made by the Committee for measures to limit puerperal sepsis is the proposal that all lying-in hospitals should have facilities for the separation of normal, suspected, and pyrexial cases. This may be accomplished by means of three individual units with separate staffs, one reserved for clean cases, one for cases of sepsis, and one for emergencies. More care in the sterilisation of the hands and the routine use of gloves are advised, as well as a thorough physical examination of the pupils and nursing staff, including a bacteriological investigation of their noses and throats. They emphasise the urgent necessity for more available beds, and for their concentration in a smaller number of hospitals, by which measure it is hoped to increase the facilities for research.

Antiseptic Toilet.

Appendix D contains a memorandum by Dr. L. Colebrook on the sterilisation of the hands. His experiments show that the initial antiseptic toilet as commonly advocated in this country—viz., thorough washing, followed by treatment of the hands for three minutes with perchloride of mercury (0·1 per cent), or lysol (0·62 per cent.) of good quality, will usually succeed, *if it is conscientiously carried out*, in getting rid of any hæmolytic streptococci with which the hands have become contaminated. Washing alone removes the greater number of such streptococci. These procedures do not, however, sterilise the hands in the bacteriological sense. Staphylococci, and sometimes diphtheroid bacilli, can still be cultivated from them. Moreover, as a means to the elimination of streptococci, this antiseptic toilet offers only a small margin of safety. If the washing is perfunctory, or the strength of the antiseptic solutions is reduced, or, again, if the streptococcal contamination of the hands is a heavy one and combined with serous discharges, killing is likely to be incomplete. He notes that iodine (0·5–1 per cent.) or chloramine T (1 per cent.) is more efficient for killing hæmolytic streptococci on the hands than either perchloride or lysol and should be tried, though their use is open to some objections (smell, staining &c.), and it is not unlikely that they would be found too irritant for frequent use. The problem of re-sterilisation of the hands at intervals is even more difficult. The midwife needs for this an antiseptic solution which can be relied upon to kill streptococci on the hands quickly—i.e., within two or three minutes at most—*and without previous washing*. Only iodine and chloramine T have been found to fulfil this condition.

His final conclusion is that in the interests of safer childbirth it is desirable that rubber gloves should be much more widely employed in all midwifery work. Smooth thin gloves can now be bought very cheaply, and, if not heated, wear well. Their sterilisation on the hands is very readily effected, with or without washing—e.g., by perchloride of mercury (0·5 per cent.) or biniodide in spirit (0·4 per cent.) or carbolic acid (1 per cent.).

EUGENIC STERILISATION.

A SHORT time ago the Eugenics Society appointed a "Committee for Legalising Eugenic Sterilisation," and this committee has now published a statement of its position. The pamphlet[1] reviews, first of all, the facts concerning the inheritance of mental deficiency. The three arguments which are adduced in favour of sterilisation as an urgent measure at the present moment are: (1) the inheritance of primary amentia; (2) the fact that high-grade mental defectives are incapable of regulating the birth of children; and (3) the substantial increase in mental deficiency during the last 20 years. The committee emphasise at the outset that their object is to remedy the ambiguity in the law, for it is doubtful whether eugenic sterilisation is or is not at present illegal. They are most anxious not to prejudice the activities of those who work for improved ascertainment, modern institutional accommodation, and better community care, for they are in entire sympathy with these measures, but they consider that sterilisation should be joined to them.

The first section of the pamphlet is devoted to a summary of the views of various authorities on the transmissibility of mental disease. Dr. E. O. Lewis concluded that the feeble-minded high-grade defectives, who comprise some 75 per cent. of the whole, tend to spring from a group composing roughly one-tenth of the total population, who are all subnormal and retarded though not necessarily defective: the "social problem" group. If the fertility of this group could be somehow limited, it is obvious that the number of feeble-minded in the country would be reduced. Quite apart from eugenics, these people bring up their children badly; they live in conditions of squalor and suffer from dirt diseases. Moreover, they are highly fertile and their birth-rate has been little influenced by the broadcast information on contraception. The birth control clinic has been powerless to reach them. Although under natural conditions the children of these people have a high mortality-rate, the maternity and child welfare work of the last 50 years has considerably reduced that mortality. In brief, therefore, the defective-producing class is multiplying at a much greater rate than any other class in the community.

The Harmlessness of Sterilisation: Legal Position.

The report hastens to contradict the erroneous view that sterilisation involves castration, and to explain the operations of vasectomy and division of the tubes. Electrical cauterisation of the tubal openings is mentioned, since it promises to make the sterilisation of the female as simple as that of the male. The legal position has been very well stated by Mr. Justice Humphreys, who was consulted by the British Medical Association. He said:—

"I am clearly of opinion that any medical man who performs the operation described upon a 'defective' within the meaning of that term as defined within the Mental Deficiency Act, 1913, would in the present state of law be

[1] The Eugenics Society, 20, Grosvenor-gardens, London, S.W. Pp. 32. 6*d*.

acting illegally and without any legal justification. I assume the consent of both parents and the excellence of the motives of all concerned, but the fact remains that the operation of sterilisation involves an assault upon and the wounding of the person operated upon. The only legal justification for such an action in regard to a person who . . . . is incapable of giving a reasoned consent, would be that the operation was necessary to the health or well-being of the patient. I do not gather from the case that it is contended that sterilisation would improve the condition, physical or mental, of the defective. The legal risks involved in such an operation would attach equally to all the persons concerned. . . . A jury might be disposed to take the view that in the public interest the conduct of the defendants was excusable, and even praiseworthy, and mitigate the damages accordingly, but, it must not be forgotten, the operation would have deprived the defective of a function which the law nowhere denies to him or her. On the contrary, the elaborate provisions of the Mental Deficiency Act for the safeguarding of such persons might be invoked as indicating that the only means sanctioned by the law of obtaining the desired end—viz., preventing the propagation of the unfit—consists in the segregation of such persons in licensed institutions."

Mr. Justice Humphreys does not refer to voluntary sterilisation, but Lord Riddell has expressed the opinion that it is illegal and constitutes a maim, and is thus a serious offence against public policy. It is, of course, undisputed that sterilisation in the interests of an individual's own health is perfectly legal, and there is some authority for believing that voluntary sterilisation would not be regarded as illegal. Ambiguity, however, remains, and needs to be cleared up before any great advance can be made towards a public policy of sterilisation.

Experience of Other Countries.

The sterilisation laws of the United States, Canada, Switzerland, and Denmark are reviewed. In 19 of the United States the purpose of the laws is both eugenic and therapeutic; in 6 it is purely eugenic, and in 2 it is eugenic, therapeutic, and penal. Seven States provide for compulsory sterilisation only, 7 for voluntary and compulsory sterilisation, and 5 for voluntary sterilisation only. As already stated in these columns,[2] 8515 operations have been officially performed in the United States up to Jan. 1st, 1928, and a careful review of the results is said to have given grounds for a satisfactory report. The evils feared by many people have not been found to follow eugenic sterilisation. The first European legislation was passed in the Canton de Vaud in 1928, and authorised the sterilisation of hereditary sufferers from mental disease or feeble-mindedness. The operation has been quite often performed privately, and the enactment in effect extends the benefits of sterilisation to those unable to pay. No results are as yet available from Switzerland. A Bill regulating eugenic sterilisation in Denmark was passed in the summer of last year in response to the pressure of public opinion. It has some unusual features; for instance, it permits a person convicted of indecent assault to ask in writing for castration. His demand may be granted on the recommendation of specialists and performed at the expense of the State. Mental patients returning to their homes and feeble-minded persons on parole may be sterilised without the consent of their relatives and on the recommendation of the director of the institution, but if an objection to the operation is raised they may be kept in the institution at the discretion of the director. Agitation for eugenic sterilisation laws is being carried on in New Zealand, Sweden, Norway, Germany, and Czecho-Slovakia; a law should come before the legislature of Sweden this year.

[2] THE LANCET, 1929, i., 924, 935.

Arguments For and Against.

The great argument for sterilisation is, in the opinion of this committee, the report of the Mental Deficiency Committee. The arguments against are briefly reviewed and countered. The grossly exaggerated idea that those who believe in sterilisation wish to sterilise every defective they can find and close down the institutions is refuted. Pessimists have argued that sterilisation cannot materially affect the number of mental defectives born, since so many of them come from apparently normal stock; but this point of view has been strongly challenged. On the most unfavourable assumption, it has been calculated that, if all primary aments ceased breeding, the incidence of defect could be reduced by as much as 17 per cent. in a single generation. The rate of elimination would, it is believed by the Committee, in practice be much greater. Defectives rarely produce normal children, and there is no single case on record of two mentally defective parents producing even a gifted or talented person, much less a genius. There is some ground for the argument that if genius is going to be suppressed at all, it will be suppressed by the practice of contraception among the educated classes and not by the sterilisation of the defectives or even by the voluntary sterilisation of the recovered insane. The idea that sterilisation might encourage promiscuity and disseminate venereal disease has not been confirmed by the experience of the United States, and the committee believe that the fear is not justified.

Proposals of the Committee.

The Mental Deficiency Committee proposed that institutions should be regarded rather as flowing lakes than as stagnant pools. Even if the present accommodation were quadrupled, it would probably at a given time accommodate only one-third of the total defective population of the community. The remaining two-thirds should have passed through the institution for stabilisation and training. The Eugenics Society's committee suggest that each defective, before being passed out into the community, should go before a board, which would consider his records in detail and would attempt to persuade him to submit to sterilisation if they thought there was the smallest risk of his becoming a parent. The Board of Control represents the view that guardianship would be a sufficient safeguard for these discharged defectives. The committee feel that this is expecting a great deal; a child may be conceived in a very few minutes, and guardians and supervisors cannot shadow their charges night and day. The committee emphasise the fact that their proposal does not militate against the policy of improving institutional provision. They hold that provision should also be made for the voluntary sterilisation of sufferers from those hereditary mental disorders which come under the heading of insanity, and propose to draft a Bill embodying these ideas. The Bill would provide for voluntary sterilisation in all cases, except that a defective of such a low grade as to be incapable of giving consent might be sterilised with the consent of his relatives on discharge from an institution. In actual practice it is rare for such low-grade cases to be discharged. A third clause would permit voluntary sterilisation of persons suffering from grave physical disease transmissible to children. A full bibliography of eugenic sterilisation is provided.

AN X RAY ROOM FOR HARROW HOSPITAL.—Kodak Ltd., whose works are at Wealdstone, in the area served by Harrow Hospital, are giving up to £1000 for the building and equipment of an X ray room at that institution.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE usual Circular (1119), containing instructions from the Ministry of Health on the annual reports expected from medical officers of health for 1930, were issued in June instead of in December this year in order to give time for the preparation of the extra information asked for. The 1930 report is to be a survey report but of a more simple character than that issued for 1925. Full information is asked for, on lines indicated in an appendix, on the transfer of poor-law functions in pursuance of the Local Government Act, 1929. In view of the proposals of the Government with regard to housing, special attention is to be given to housing defects and the compilation of accurate records with regard to the housing position.

The following are 1929 statistics of two south-coast and one east-coast county borough, and of three county boroughs on or near the Lancashire coal-field.

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Brighton .. (146,800)	13·4	14·5	0·98	1·79	2·4	2·8	55/26	23	2·5
Hastings .. (62,620)	12·2	15·9*	0·83	2·36	3·3	3·0	35/18	17	1·3
Gt. Yarmouth (58,110)	14·8	14·4†	0·98	1·72	2·7	2·6	59/25	29	4·6
Blackburn .. (125,300)	12·4	14·9	1·01	1·53	3·9	2·5	80/33	45	9·6
Stockport .. (127,800)	13·3	13·9	0·95	1·59	3·1	2·5	91/47	40	6·5
Bury .. .. (56,830)	13·6	16·4	0·81	1·71	4·2	3·3	79/48	44	6·4

Registered stillbirths per 100 live births: Brighton 4·2, Hastings 3·1, Gt. Yarmouth 2·9, Blackburn 4·8, Stockport 5·6, Bury 5·3.

*Standardised 11·4. †Standardised 12·0.

Noteworthy features of this table are the fact that the low birth-rates and influenza have abolished the natural increase of the populations, and the much smaller chance of survival for children born in the three northern towns.

Brighton.

Dr. Duncan Forbes expresses his regret that the form of report laid down by the Ministry of Health, which is convenient for national and comparative purposes, entails an aggregation of tables which makes dreary reading.

The conditions of housing have steadily improved in Brighton, but there are still cases of five or six sleeping in one room. Since the war the corporation have built 1726 houses and private enterprise 1656. The corporation houses completed in 1929 numbered 246 and 252 more were in course of erection. Over 5 per cent. of these houses are not kept clean, the worst tenants being slum-dwelling families removed with the hope of an improvement in good surroundings. The rent charged to such tenants is 12*s.* per week, for a three-bedroom non-parlour house, but they cannot usually pay more than 8*s.* The number of tuberculous patients requiring refills, after artificial pneumothorax, is on the increase. During the year 22 refills were given at the dispensary and 108 at the sanatorium. Applications for refills from patients operated on elsewhere are complied with. The tuberculosis officer, Dr. A. Neville Cox, considers light treatment unquestionably beneficial in most forms of non-pulmonary tuberculosis, usually after very prolonged treatment. He is not satisfied that artificial light is better than heliotherapy for tuberculous glands, joints, and peritoneums, but it is more dependable and more convenient for patients at work. In lupus and where there is pulmonary disease artificial light, he thinks, has the advantage. Most of the antenatal work is done at the Sussex Maternity and Women's Hospital, antenatal examination being one of the conditions of booking. This hospital employs 20 certified midwives and the number of Brighton patients attended by them was 751. The hospital admitted 117 Brighton patients under an agreement by which the council pays 7*s.* 6*d.* per day. The total cost was £632, of which £359 was paid by the patients and the Sussex Provident Scheme. Up to the end of 1929 sections of the livers of 202 stillbirths had been examined and spirochætes were found in 12 of them. It is concluded that general practitioners do not treat syphilis, since no doses of salvarsan substitute were applied for by them. Doses were, however, supplied to two specialists. An effort is being made to try out a better system of refuse removal with special bins and carts. During the year 12 out of 75 samples of milk examined were found to be tuberculous.

Hastings.

Dr. G. R. Bruce reports that the most used infant welfare centre will be swept away by the Front Line Improvement Scheme, and that it will be difficult to obtain central premises accessible for the mothers of the Old Town. Antenatal work continues to increase, but full use is not as yet made of the 12 beds at Fernbank Maternity Home. The open-air school has given very good results and a second one is to be established for 30 delicate children from the St. Leonard's side of the borough. The Orthopædic Scheme, with the Royal East Sussex Hospital as base, continues to work smoothly and dealt with 52 Hastings cases during the year. Of these, 23 were of pre-school age, 21 were school-children, and 8 were tuberculous. The patients included 11 congenital conditions, 7 cases of infantile paralysis, and 12 of rickets. No new municipal houses were erected, but towards the end of the year the corporation secured an excellent site and a start is to be made with 100 houses. There is a waiting-list of about 600, many of whom live in overcrowded sub-let rooms, in cottages of a low sanitary standard, or in basements. Some of these with large young families cannot pay the rents of municipal houses. Dr. Bruce considers there is a good field locally for the reconditioning and renovating of existing houses, and he would like to see this type of housing reform taken up by private enterprise or a public utility society. Immunisation against diphtheria was adopted with satisfactory results in an institution where there had been a succession of cases for a period of over six months. During 1929 Hastings had 2002·7 hours of bright sunshine and a rainfall of 31·58 inches, this being 3·75 inches in excess of the normal.

Great Yarmouth.

Dr. A. N. Stevens says the hours of bright sunshine recorded were 1624·4 and the rainfall 18·73 inches, as compared with an average of 24·8 inches. Over 57 per cent. of the deaths of Yarmouth residents occurred at ages above 65, and over 32 per cent. at ages above 75. Two-thirds of the confinements in Great Yarmouth are attended by medical practitioners and only one-third by midwives. The Notification

of Births Act is not enforced. Of 865 births, 219 were not notified. The 307 births attended by midwives were all notified. Apparently the notification of puerperal fever is in the same position, seeing that there were four notifications and three deaths. Inquiries made showed that 95 per cent. of 787 babies were breast-fed during the first month and that 78 per cent. of 619 were breast-fed during the fourth month. A difficulty was experienced in filling vacancies for health visitors for nearly the whole of the year. Diphtheria was more prevalent than during any year of the last decade. There were 107 notifications and three deaths. From March to June 22 cases occurred in the East Anglican School for Blind and Deaf Children, and in consequence immunisation was offered for all the scholars whose parents gave their consent.

Blackburn.

Dr. V. T. Thierens submits a table showing that the birth-rate has declined nearly 50 per cent. during the last 10 years; that twice during that period there has been a natural decrease of population, namely, 1·3 per 1000 in 1927 and 2·5 in 1929; also that during the remaining 10 years the highest natural increase was 8·2 per 1000 in 1920, and the lowest 1·0 in 1925. He states that owing to trade depression comparatively large numbers leave the town. The chief industry is cotton-weaving and allied processes. Scarlet fever and diphtheria were unusually prevalent; the former was of a mild type. This disease showed itself in severe form and accounted for 18 deaths, a case-mortality rate of 10·1 per cent. Of the fatal cases, none had received antitoxin before the third day of the disease. An immunisation clinic was opened in November. The Schick test is not being used for children up to the age of 7 years. There were 34 cases of small-pox, all but one of a mild type, and no deaths. Dr. Ella Mackenzie conducts an antenatal clinic twice weekly, which was attended by 70 more women than in 1928. The midwives sent up 92 cases compared with 77 in the previous year. A course of lectures by well-known obstetricians was given to the midwives in order to stimulate their interest in antenatal work. Dr. Mackenzie's investigation of the 15 maternal deaths showed that 2 were associated with eclampsia, 2 with placenta prævia, 2 with puerperal sepsis, 2 with septic peritonitis (one being after an illegal operation), 3 with pneumonia, and 4 with other conditions. Her investigation of 75 still-births showed that in 33 the cause was unknown and that the principal among the known causes were: breech presentation, 7; difficult forceps, 3; placenta prævia, 5; toxæmia, 9; and "probable" syphilis, 3. The deaths of pre-school children were 70 as compared with 43 in 1928, pneumonia showing the chief increase from 11 to 29. There are now 11 nursery classes in Blackburn with accommodation for 450 children under the age of 5 years. The corporation erected 194 new houses and private enterprise 84, and at the end of the year 194 municipal houses were in course of erection. The inclusive weekly rental is 13*s.* 10*d.* for a non-parlour house with three bedrooms; 11*s.* 11*d.* for one with two bedrooms. The waiting-list for municipal houses of the various types at the end of 1929 was 753. Dr. Thierens says the population is comparatively well-housed and that there are no well-defined slums.

Stockport.

Dr. Nicolas Gebbie tells us that the rivers Goyt and Tame unite at Tiviotdale to form the Mersey, and that the borough is situated on both the Lancashire and Cheshire sides. Near the river stands the old part, around which a large town has grown, the chief occupations of which are cotton-spinning, weaving, and doubling, hat manufacture, &c. The inhabitants are chiefly housed in dwellings of the cottage type, "two up and two down," placed in long rows. There is a serious shortage of houses; the "subsidy" houses, erected in 1929, were 112 municipal and 235 by private enterpris The Municipal Maternity Hospital has accommod tion for 16 mothers and 16 babies; in it 165 wome were delivered by midwives and 60 by doctor Patients not attended by a doctor are examine by Dr. Jean Mackintosh prior to discharge and fo weeks later at the clinic. Dr. Mackintosh al conducts the four antenatal clinics which we attended by 863 expectant mothers. The midwiv coöperate well; 60 per cent. of the midwives' cas attended in 1929 compared with 37 per cent. in 192 The orthopædic scheme at Stockport Infirmar associated with the Orthopædic Hospital at Oswestr is utilised by both the tuberculosis and child welfa departments. The provision of additional accon modation at the Isolation Hospital is under consider tion, and another need pointed out by Dr. Gebb is a destructor to reduce the tip nuisance.

Bury.

Dr. G. Granville Buckley speaks of the increasi neglect of vaccination. During 1929 only 12·8 p cent. of the children born were vaccinated. Th high mortality among children of ages 1 to included 9 deaths from pneumonia, 7 from bronchiti 6 from whooping-cough, and 2 from measle The notifications of diphtheria (165) were mo numerous than ever before, but the case-mortalit was only 3 per cent. Bury joins in the count orthopædic scheme and sent 10 pre-school childre to the county clinic, one of whom was admitte to Biddulph Hospital. The V.D. officer, Dr. Holker, says that practitioners use the clinic increa ingly. Since many cases are only sent to him the secondary stage, he infers that some practitione do not realise that spirochætes can be detect in a primary sore before the Wassermann reactic is positive. He points out that smears should taken before treatment and that soft chancres a frequently syphilitic. The sewage of the borou is of a complex nature and includes trade wast from tanneries, fell-mongers, wool scouring, hatter breweries, and gas liquor. Three separate systen follow the sedimentation tanks, including an activat sludge unit. A further extension has been necessitat by the admission of spent ammoniacal liquor fro the gas works. A sludge plant has been install but at present the sludge is disposed of on lagoon Of the last six samples of effluent taken by t inspectors of the Mersey and Irwell joint cor mittee two were satisfactory and four were ba During the year 213 half-hour observations black smoke were taken and four firms exceed the limit of two minutes black smoke per ha hour, the average emission being six and a ha minutes per half hour. Appropriate remedial ste were taken. Bury has had a model public abatto since 1903 (when all the private slaughter-hous were abolished), which could deal with three or fo times the present call upon it.

A MIDDLESEX CONVALESCENT HOME.—Lo Rochdale, Lord-Lieutenant of Middlesex, recently opened convalescent and holiday home for necessitous Middles school-children at Collington Manor, Bexhill. It has be purchased and equipped by the Middlesex King Edward V Memorial Fund.

HOSPITALS FOR THE SCOTTISH ISLES.—The Scotti Department of Health has made a grant of £6000 for t erection and equipment of a Cottage Hospital in Islay; t cost of maintenance will be borne locally. It is understo that the Bute Hospital in South Uist will shortly be de with by the Department.

MANCHESTER BABIES' HOSPITAL.—The report stat that there were 474 admissions and 70 deaths during t past year, a percentage of 14·73. The average stay of cases was 60·50 days, and of fatal cases 27·48 days—18 cas died within 48 hours of admission. The out-patien department has passed the experimental stage and is n firmly established, 644 cases having been treated during t first year.

SCHOOL MEDICAL SERVICE.

—	No. on roll.	Average attend-ance.	Routine inspec-tion.	Special exams. and reinspec-tions.	Percentage of defects.
Leeds	73,613	—	20,384	68,990	35·7
Gillingham ..	8,137	7,299	2,846	2,279	16
Eastbourne..	4,928	4,391	1,653	6,803	10·7

Leeds.

On the subject of malnutrition, Dr. Algernon Wear truly remarks that "many of these children are in need of a good midday meal and more sleep." His assistants, Dr. Stockwell and Dr. Wood, point out that "the open-air school as a method of treatment (including correct feeding and malt and oil) is incomparably ahead of anything we do or can hope to do by the artificial sunlight treatment," and it is satisfactory to note that plans have already been prepared for an open-air school at which the children will have the benefit of good diet, rest, fresh air, sunlight, and other favourable influences.

An interesting experiment on the effect of extra milk is described. A comprehensive scheme was undertaken in coöperation with the medical officer of health (who controlled the quality and purity of the milk), the Dairymen's Association, the National Farmer's Union, and the head teachers. The number of children to whom extra milk was given averaged over 20,000, their parents paying 1*d.* a day. At the time of writing the scheme has been in operation for only three months, but comparisons with other children show that except for boys of 7 and 11 the average weight of those receiving the milk is substantially above the average for the city.

Children taking part in public entertainments are exposed to many adverse influences, and at the medical examination it was found that many of them were below the average standard of health and suffering from overstrain. "It would appear," says Dr. Wear, "that for such a strenuous life only the exceptional physical type should be certificated," but in practice, of course, these children are often of a type which is unusually susceptible to nerve strain. Mr. Capes, the inspector for employment of children, in his appended report questions whether the minimum age for their certificate should not be raised to 14 and whether the latest hours allowed should not be 9 P.M. All these suggestions are worthy of careful consideration, and in our opinion it would be well if all authorities who license theatrical children realised their responsibilities and maintained a uniform standard.

The authorities in Leeds are to be congratulated on maintaining a nursery school and also on the attention that is being called to the needs of stammerers. It may appear contradictory to the ideals of progress that a decrease in the number of attendances at the treatment clinics should be welcomed, but it is explained that it has been felt for some time that children were forming a "clinic habit," because they enjoyed the change from lessons. This year the attendances have been kept down by stricter observation, especially of trivial complaints, and at one clinic minor ailments are to be dealt with at 4 P.M. in order to thwart the juvenile ingenuity.

Gillingham.

Comparisons are proverbially undesirable, but it is impossible to ignore the fact that there are several towns smaller than Gillingham which have made more complete arrangements for the treatment of defects and for the care and education of exceptional children, though the efficiency of the medical officers is evident. Some orthopædic cases attend St. Bartholomew's Hospital, Rochester, but there is no orthopædic scheme. There are no systematic in-patient arrangements for dealing with tonsils and adenoids; patients remain for some hours after operation and are re-examined by the house surgeon, and may be kept in overnight if there are exceptional features. Those sent home travel by the corporation ambulance. The dental scheme is not complete enough to allow of the re-examination of every child annually, but this ideal is attained only by a comparatively few very progressive towns; at Gillingham the dentist's sessions have been increased from three to five a week, so that it was possible to examine all children from 6 to 10 years old. The anæsthetist for dental work is Dr. Meta Dunlop, who acts also as part-time assistant school medical officer. Here, again, Dr. W. A. Muir, who acts both as medical officer of health and school medical officer, is at a disadvantage compared with many of his colleagues, for Dr. Dunlop devotes to school inspections only seven sessions a fortnight. With the inclusion of the parish of Rainham and other demands on his time it is clear that Dr. Muir will need more help.

No nursery school has been established in the borough nor are there special schools of any kind; the need for an open-air school appears particularly urgent. Eighteen exceptional children are, however, maintained by the education committee in various special schools outside Gillingham, and though there is no special school for mental defectives there is an active branch of the Kent County Association for Mental Welfare which successfully maintains an occupation centre.

The number of cases of malnutrition recorded at medical inspections is only six, but nearly 200 children were having free dinners last year. In July, 1929, Dr. Muir suggested to the committee that instead of this free dinner a pint of milk should be given daily, the cases being recommended by school medical officers on medical grounds and by head teachers on financial grounds. Shortly after this scheme began a number of other parents asked for their children to have milk, stating that they were willing to pay for it. Special care was taken to obtain the best milk in good condition, and the scheme, which came into operation on Nov. 4th, promises very well.

Though the facilities at Gillingham are not at present extensive it is evident that the medical inspectors are held in high regard, for the proportion of parents attending inspections was 80 per cent. at all ages and 94 per cent. for entrants.

Eastbourne.

Eastbourne is exceptional in the small proportion of children to the general population. The percentage fell from 21·19 in 1891 to 16·4 in 1921, and is still falling. Yet in some quarters more accommodation is needed because through the housing schemes some families have moved from the centre to the border of the borough. The percentage of attendances (89·1) is good and shows the careful activity of the school attendance officers. In view of the small numbers, the arrangements for the treatment of defects are very satisfactory, and there are nine varieties of clinic in the borough. There is also an open-air school which is giving good results. Dr. E. H. B. Coghill, the assistant school medical officer, says that the children admitted to this school, although classified into those suffering from anæmia, debility, malnutrition, and outgrowing strength, show in fact a very similar picture in each case, and that the accompanying report from the old school is almost invariably the same, the comment being "listless," "easily fatigued," "poor concentration," "poor progress in school work generally." The average period during which the children remained at the school was 25 months, and in no case during the year was it found necessary to readmit a child previously discharged as cured. These results are attributed largely to the keen interest taken in the medical side of the work of the headmistress, Miss Martin, and her staff. The arrangements for exceptional children are also good.

Among other activities noted by Dr. W. G. Willoughby in his report are: (1) the supply of milk to 364 children, due to the enterprise of the head teachers; (2) health propaganda by the

issue of 2000 copies each month of a monthly journal *Better Health* through the schools; (3) school camps held in July; (4) physical training organised by Captain Stainfield; (5) in secondary schools flat-foot and slight degrees of spinal curvature have been improved by exercises, and in the girls' school foot troubles are less frequently complained of since the all-day use of "plimsols" has been vetoed and house shoes with low heels have been substituted.

MENTAL HOSPITAL REPORTS.

THERE were 675 patients on the books of the CITY OF LONDON MENTAL HOSPITAL at STONE on the last day of last year. During the year 121 certificated and 100 voluntary patients were admitted. The recovery-rate of the patients under certificate was 44 per cent. of the direct admissions, and their death-rate 7·8 per cent., while 40 per cent. of the voluntary patients left the hospital recovered or relieved. There was very little illness during the year. General paralysis has been successfully treated by malaria, and the operating theatre, X ray room, dental surgery, and laboratory have all been in constant use. Parole beyond the estate was allowed to 58 men and 24 women, and within the grounds to 88 men and 137 women. Two male and three female wards are administered on the open-door principle. Three nurses and three attendants obtained their R.M.P.A. certificates, two of them with distinction.

The BRIGHTON COUNTY BOROUGH MENTAL HOSPITAL had 875 patients in residence on Dec. 31st last. The recovery-rate for the year was 42·2 per cent. and the death-rate 10·1 per cent. Five general paralytics received malarial treatment at Hellingly and one has been discharged. On an average there have been 18 male patients and 39 females on full parole, and an additional 53 men on parole within the grounds. A number of patients have had week-end leave. Some difference of opinion has arisen in the committee as to the best site for the proposed admission hospital, but it is hoped to proceed with the building before long. A new cricket pitch has been made in the park. The dental surgeon attended 750 patients during the year. Since the out-patient clinic opened at Brighton in January, 1926, 371 patients have attended; there were 90 new cases during 1929. Three patients have been certified under the Mental Deficiency Act, but none at all under the Lunacy Act. Not one of the 200 patients admitted to the mental hospital during the year from Brighton had attended the out-patient clinic.

Of the two mental hospitals under the ESSEX AND COLCHESTER COMMITTEE, that at BRENTWOOD had 1774 patients under care at the end of last year. The death-rate was 6·22 per cent., the lowest on record for this institution, despite the fact that 16 patients died of general paralysis and 15 of cardio-vascular degeneration. Post-mortem examinations were made in 81 per cent. of cases. The general health was very good and there were no epidemics. General paralysis has been treated by malaria with encouraging results, and other methods of producing fever are being tried. The visiting surgeon has performed several urgent operations and the dentist has attended twice a week. The dispenser is also an optician, and has done a good deal of sight-testing. For the first time the home dairy herd has supplied all the milk required, some 620 quarts daily, and nearly all new patients show a marked gain in weight. The hospital has for some time been overcrowded, and the opening of the new nurses' home will give some relief, as well as enabling the staff to spend off-duty hours away from the wards. Ten men and 16 women obtained their R.M.P.A. certificate during the year, three of the men with distinction. Electricity is now available throughout the hospital and is proving a great boon. A general purposes machine has been set up in the kitchen and a refrigerating plant is to be installed. New clinical rooms have been equipped in the male infirmary and admission wards. The weaving and handicraft department keeps many patients usefully occupied. Three female and five male wards are open, and parole and week-end leave are freely granted. Patients are clothed in dresses of different colours and style and the more responsible ones are allowed to choose the fashion of their clothes.

The hospital at SEVERALLS had 1819 patients in residence at the end of the year. The death-rate was 9·24 per cent., and the general health was satisfactory except for a few cases of colitis during the autumn. The recovery-rate was 25·8 per cent. Occupational and ultra-violet light therapy are giving very satisfactory results. The open-air treatment of acute cases has proved an unqualified success and the new canteen promises to be most useful. A pathological laboratory has been completed and will soon be in use, but the X ray plant is nearly obsolete and needs replacing. Three male and two female wards are open to the grounds and four other wards to gardens. Parole and leave are given as far as possible. The nursing staff are prepared for examination, and 92 men and 46 women have now passed their final.

On the first day of this year there were 714 patients at the LEICESTERSHIRE AND RUTLAND MENTAL HOSPITAL, NARBOROUGH. The recovery-rate for the year was 40·88 per cent. and the death-rate 8·22 per cent. One ward on either side is administered on the open-door principle; 12 men have full parole and 40 have parole within the grounds. Nearly 6000 articles of clothing were made in the hospital during the year, and the tailors' and shoemakers' shops were also kept busy.

The EAST RIDING MENTAL HOSPITAL at BEVERLEY housed 603 patients on March 31st of this year. The recovery-rate was 38 per cent. and the death-rate 10·68 per cent. Autopsies were performed whenever permission was granted—i.e., in 83 per cent. Hydrotherapy has given very satisfactory results in acute cases, and a continuous bath is to be installed in the female admission ward. Encouraging results have been obtained from the use of tryparsamide in neurosyphilitic cases and malarial therapy is used for cases which do not respond to tryparsamide. Forty patients are allowed parole outside the estate, and 12 within the grounds; the men greatly enjoy the local race meetings. A cinema has been installed. Arrangements have been made to accommodate mentally defective children elsewhere; this will relieve congestion in the hospital and be better both for the children and for the hospital patients. A consulting surgeon has been appointed. The dentist paid 26 visits during the year and examines all new patients systematically. There is a shortage of female nurses, but 54 per cent. of the men and 17 per cent. of the women hold the R.M.P.A. certificate.

The GLAMORGAN COUNTY MENTAL HOSPITAL at BRIDGEND had 2030 patients on the register at the end of last year, and overcrowding is acutely felt. The recovery-rate was 27 per cent. and nearly all recovered patients showed an increase of several pounds in weight. The death-rate was 8·2 per cent. The general health was good, except for an influenza epidemic, four cases of dysentery, and one of erysipelas. The visiting surgeon performed an operation for appendicitis and 300 patients received dental treatment. Plans are in hand for the erection of an admission hospital, convalescent home, and nurses' home. The inmates are employed as far as possible, but there is no occupations officer. Full parole is allowed to 9 men and limited freedom to 90, but no women have this privilege. The death-rate from tuberculosis is higher than the average of mental hospitals—viz., 10·1 per cent.—and modern methods for treating general paralysis are not yet in use. Of the 25 candidates, 10 men and 5 women obtained their R.M.P.A. certificate during the year.

The JOINT COUNTIES' MENTAL HOSPITAL at CARMARTHEN housed 659 patients on March 31st last.

The recovery-rate was 35·2 per cent., and 91 per cent. of the patients who completely recovered were in residence for less than a year. The death-rate was 10·62 per cent. and the general health was unsatisfactory. There was influenza in the spring, 13 cases of diarrhœa, 4 of dysentery, 3 of enteric, and 8 of tuberculosis. Two surgical cases were sent to the infirmary for treatment. The dentist saw 158 patients. A new water-supply has been completed. Patients are being instructed in rug making and an attempt is to be made to expand the scheme of industries. Parole is allowed to 4 men outside and 84 inside the estate, but not to any women, and only 10 patients were allowed out on trial. Four nurses passed the final examination for the R.M.P.A. certificate.

PRIVATE INSTITUTIONS.

The JAMES MURRAY'S ROYAL ASYLUM, PERTH, presents its 103rd report this year. There were 192 patients on the register on April 1st last, but owing to lack of accommodation a number of applications for admission had to be refused. A new reception hospital is being built at Gilgal and will be available, it is hoped, before the winter. During the year 24 certified and 57 voluntary patients were admitted. Seventeen certified and 20 voluntary patients were discharged recovered, and 9 voluntary patients were certified. The death-rate was 12·43 per cent. and post-mortem examinations were made in 8 of the 22 cases. The institution had the misfortune to suffer from a fire on April 19th. The damage has been assessed at £2400, but would have been greater had not the wing been rebuilt in 1837 with fire-proof arches. The routine of the institution was maintained remarkably well. Five nurses and four attendants obtained their R.M.P.A. certificate during the year.

At BARNWOOD HOUSE, near GLOUCESTER, there were 141 patients at the end of last year, and also 18 voluntary boarders. There is a great demand for admission to the Manor House, where voluntary boarders are received. The recovery-rate was 32·5 per cent. and the death-rate 7 per cent. There was an epidemic of influenza in the spring, but otherwise the health was good. A patient suffering from taboparesis improved under malarial treatment, and three cases of confusional insanity were found to be suffering from an unusual type of intestinal toxæmia. The visiting pathologist and the dentist have both extended their work, and an ultra-violet ray lamp has been purchased. The electrification of the hospital was completed during the year and a cinema and a refrigerator have been provided. Arts and crafts are taught to the ladies during the winter, and a seaside house is taken for the summer. In the competition of the Gloucestershire Milk Recording Society the institution obtained the Cadbury Cup and Gold Medal for clean milk. Another nurse obtained her certificate, bringing the total certified or registered to 21 men and 18 women

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 2ND, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 70 (last week 109); scarlet fever, 1778; diphtheria, 1108; enteric fever, 92; pneumonia, 431; puerperal fever, 46; puerperal pyrexia, 111; cerebro-spinal fever, 4; acute poliomyelitis, 13; acute polio-encephalitis, 6; encephalitis lethargica, 13; continued fever, 1; dysentery, 22; ophthalmia neonatorum, 111. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 5th–6th was as follows: small-pox, 218 under treatment, 10 under observation; scarlet fever, 1779; diphtheria, 2007; enteric fever, 38; measles, 219; whooping-cough, 83; puerperal fever, 15 (plus 8 babies); encephalitis lethargica, 119; "other diseases," 20. At St. Margaret's Hospital there were 14 babies with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 13 (1) from measles, 7 (3) from scarlet fever, 18 (0) from whooping-cough, 35 (17) from diphtheria, 37 (7) from diarrhœa and enteritis under two years, and 12 (0) from influenza. The figures in parentheses are those for London itself.

No great town reported more than 1 death from measles with the exception of Liverpool with 2. Liverpool also reported 4 deaths from whooping-cough, Bristol and Leeds each 2. Four deaths from diarrhœa were reported from West Ham, 2 each from Willesden, Portsmouth, Leicester, Derby, Liverpool, Manchester, Rochdale, Leeds, and Sunderland.

The number of stillbirths notified during the week was 265 (corresponding to a rate of 37 per 1000 births), including 45 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. L. Warren to *Pembroke*, for R.N. Hospital, Chatham.

Surg. Comdr. G. S. Harvey to *Pembroke*, for R.N. Hospital, Gt. Yarmouth.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lts. W. J. Poole and V. S. Hughes-Davies to be Surg. Lts.

Proby. Surg.-Lts. G. M. Tanner and A. D. Hepburn to be Surg.-Lts.

Proby. Surg.-Lts. (D) to be Surg.-Lts. (D): F. A. Pearse, A. W. Y. Price, and R. W. Stevens.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. E. G. Anthonisz, Reg. Army Res. of Off., to be Maj., whilst re-empld. under Art. 507 (b), Royal Warrant for Pay and Promotion, 1926, and relinquishes the rank of Lt.-Col.

Maj. A. D. O'Carroll retires on ret. pay, and is granted the rank of Lt.-Col.

Maj. D. T. Richardson to be an Asst. Professor at the R.A.M. Coll.

Maj. (now Lt.-Col.) A. Dawson to be an Asst. Professor at the R.A.M. Coll.

ARMY DENTAL CORPS.

The undermentioned Capts. to be Majs.: G. A. G. Jones, E. H. C. Caute, C. V. Walker, M. J. O'Reilly and T. Pearson.

Lt.-Col. & Bt. Col. J. A. Seymour, having attained the age for compulsory retirement, is placed on retd. pay.

Maj. J. V. M. Byrne to be Lt.-Col., vice Lt.-Col. & Bt. Col. J. A. Seymour.

Lt. P. M. Margand, Dental Surg., relinquishes his temp. commn. on appt. to a non-permanent commn. in the R.A.F.

RESERVE OF OFFICERS.

Maj. A. H. Hayes, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Lt.-Col. D. S. Sutherland to comd. 12th (2nd Western) Gen. Hosp.

Capt. F. B. Chavasse resigns his commn. and retains his rank, with permission to wear the prescribed uniform.

Capt. S. Orchard resigns his commn.

J. F. Wilde (late Temp. Capt., R.A.M.C.) to be Capt. with seniority.

Lt. W. R. Nash (late R.G.A., Spec. Res.) to be Lt.

J. W. Graham to be Lt.

The King has conferred the Territorial Decoration upon Capt. K. B. Dickson.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. J. Ramsay, from Active List, to be Lt.-Col.

Maj. H. J. Dunbar, having attained the age-limit, retires and retains his rank, with permission to wear the prescribed uniform.

Lt. T. A. A. Hunter, from Active List (Supern. for serv. with O.T.C.), to be Lt.

ROYAL AIR FORCE.

Flight Lt. A. F. Cook ceases to be seconded for duty with the Trans-Jordan Frontier Force.

Denal Branch.—The undermentioned Flight Lieutenants (Temp. Captains, General List, Army Dental Surgeons)

are granted non-permanent commissions as Flight Lieutenants: J. M. Jamie and H. D. Humphreys.

INDIAN MEDICAL SERVICE.

Lt.-Col. H. R. Nutt to be Col.

The undermentioned officers retire: Lt.-Cols. D. McN. Taylor, D. Heron, and G. I. Davys.

COLONIAL MEDICAL SERVICES.

Dr. J. W. P. Harkness, Senior Medical Officer, Palestine, and Dr. N. M. Maclennan, Health Officer, Kenya, have been promoted Deputy Director and Senior Medical Officer respectively, to the Department of Health, Palestine.

The following appointments have been made: Miss F. A. Adam, Lady Medical Officer, Gold Coast; and Dr. P. F. S. Court, Dr. G. V. A. Griffith, and Dr. J. B. Mackie, Medical Officers, Hong-Kong; Dr. P. J. Bourke has been appointed a Medical Officer in the West African Medical Service, and Dr. A. Cathcart, Medical Officer at Sierra Leone, West African Medical Staff.

DEATHS IN THE SERVICES.

Surg.-Capt. Douglas Duke Turner, R.N., retired, who died at the age of 53 in the Royal Naval Hospital, Haslar, on August 4th, qualified with the conjoint diploma in 1900 and entered the Naval Service in 1904. He was promoted to staff surgeon some eight years later, and was medical officer to the cruisers *Sappho* and *Devonshire*, and after his promotion to Surg. Commander in 1917 he occupied a similar position in the cruiser *Concord*, the battleship *Resolution* and the *Defiance*, torpedo schoolship at Devonport. He retired with the rank of surgeon captain, 1927.

CORRESPONDENCE

UMBILICAL HERNIA IN INFANTS.

To the Editor of THE LANCET.

SIR,—May I be allowed to say a few words about Mr. C. P. G. Wakeley's article on this subject which appears in the "Modern Technique in Treatment" series in your issue of August 9th. Inasmuch as the views expressed in this article are in conflict with what is generally taught and practised in our welfare centres, it is important that both sides of the question should be discussed so that the truth may prevail. Mr. Wakeley claims that the condition is more common now than it was 20 or 30 years ago. This statement is unsupported by statistical evidence, and although I have none to offer, I may state—for what it is worth—that this is quite contrary to my own personal experience. Both in private and in hospital practice I am under the impression that I see far fewer cases of this kind now than I did formerly.

Again, one of the causes assigned by Mr. Wakeley for umbilical hernia is artificial feeding, and he adds that artificial feeding is more generally employed now than 20 or 30 years ago. But is this so? I very much doubt it. Most welfare centres and well-informed medical practitioners now make very successful efforts to popularise breast-feeding, especially during the first few months of life, when the character of the feeding is most likely to affect the issue in question. My general impression is that I see more cases of umbilical hernia among breast-fed infants than among artificially fed infants. This may be because there are more breast-fed infants, or it may be that over-feeding is more likely to occur under uncontrolled breast-feeding than under controlled bottle-feeding.

Another cause of umbilical hernia assigned by Mr. Wakeley is the almost universal abandonment of the binder, and he gives it as his opinion that it is of the greatest importance that infants should wear abdominal binders until at least six months old. If this advice, he says, were followed, "there would be far fewer cases of infantile umbilical hernia attending our hospitals." For my part, I think that if this practice were adopted there would be a larger number of infants attending our hospitals for digestive and other abdominal troubles. I have seen several cases of inguinal hernia brought about by the use of the tight circular binder employed to control umbilical hernia—a very natural consequence owing to the rise in abdominal pressure to which such treatment would tend.

Mr. Wakeley gives very full particulars of the operation he advocates for umbilical hernia. In the whole of my experience I have never found it necessary to resort to operative treatment for this condition. The very simplest precautions will prevent the development of umbilical hernia, and the common-sense use of a little strapping properly applied, but not quite in the manner described in the article referred to, will cure the condition. I am told that quite a large number of Zulu infants, the majority of whom are breast-fed, as well as many other South African native infants suffer from umbilical hernia, but that the condition is never found amongst the adult population, for the reason that spontaneous cure always occurs when the recti muscles become adequately developed—a result which the binder would certainly delay.

Although at the present time I have no statistical evidence on the points raised, I understand from Dr. Jean Smith, the registrar at the Infants Hospital, that she will try to produce some with respect to the relative frequency of umbilical hernia amongst breast-fed and artificially fed infants, and also with respect to the frequency of the condition among all classes of infants attending the hospital.

I am, Sir, yours faithfully,

ERIC PRITCHARD.

Harley-street, W., August 9th, 1930.

TREATMENT OF PULMONARY TUBERCULOSIS IN SWITZERLAND.

To the Editor of THE LANCET.

SIR,—Dr. Harrison's general proposition, that rest and prescribed exercise occupy a more important place in the treatment of pulmonary tuberculosis than climate, is in conformity with modern views. The point will bear emphasis over and over again, for the majority of patients, sanatorium committees, and even medical practitioners are slow to appreciate its full significance. I cannot, however, agree with Dr. Harrison when, in a sweeping generalisation, he decries the treatment conditions in the high Alps.

Having visited the chief sanatoria of Davos, Arosa, Leysin, and Montana I have been impressed with the cold, dry, windless atmosphere, with brilliant sunshine generally present in these places in winter, and contrasting so favourably with the damp misty conditions which so often prevail in England. Especially at Montana are climatic conditions particularly favourable. There one lives above the clouds, and looks down on the "sea of mist" hundreds of feet below. The sunshine record, I believe, is among the best of all Alpine villages. Most of the patients I saw were British. English was freely spoken. The British sanatorium there was not over-heated like so many which cater for continental patients. The patients were far from being bored by the eternal snow. Many with whom I conversed were watching with amusement the sport on the ice

ink, the toboggan and ski runs, while sitting or trolling in brilliant sunshine. The whole atmosphere was joyful, uplifting, and could be, at the same time, profoundly restful. Compared with it, the average humid winter day in England is gloomy to a degree.

Another point of the greatest importance in favour of the Swiss curing stations is the wealth of specialist medical talent available at each centre. Tuberculosis has been the prime medical interest of the whole coterie of doctors in each centre for many years. There is a vast accumulated experience of the disease. Every advance in treatment is exhaustively discussed and tried out with avidity. While every doctor specialises in tuberculosis, there is, moreover, a specialist for each branch of the subject, be it X ray diagnosis, oleothorax, thoracoplasty, or any known treatment. In this respect each centre may claim to be a complete unit for the treatment of tuberculosis.

Doubtless in some institutions the discipline of routine treatment may not be so rigid as it should be, but, as far as I could judge, this did not apply in Montana, where also the arrangements are particularly well suited to British people.

I am, Sir, yours faithfully,

H. STANLEY BANKS,
Medical Superintendent, Isolation Hospital and Sanatorium, Leicester.

August 11th, 1930.

THE DUTCH PESSARY.

To the Editor of THE LANCET.

SIR,—I am glad that Dr. Helena Wright has called attention to the importance of using a second contraceptive with a Dutch rubber pessary. Where it is important to prevent conception I believe the physician should advise a carefully fitted rubber pessary, lubricated with a contraceptive spermaticide such as Dr. Haire recommends and, in addition, a soluble pellet or pessary containing quinine or other substances of a well-known brand, which must be freshly prepared. I recommend douching next morning before and after the removal of the rubber pessary. I think disappointment has occurred in the past through using pessaries unnecessarily large. My own experience is that the majority of women are best fitted with 50–55, and less commonly 60 mm. Each case has to be judged separately. Women with a well-formed os, where there is no tear, may find the check pessary with the self-retaining rim perfectly satisfactory. In a few instances no form of rubber pessary is of the slightest use; in this case a soluble pellet or pessary and a rubber sheath should be recommended when it is necessary to prevent conception. In my opinion, this last is the most reliable method.—I am, Sir, yours faithfully,

ELIZABETH SLOAN CHESSER, M.D.
Harley-street, W., August 12th, 1930.

MEDICAL NEWS

University of Cambridge.

At a congregation on August 2nd the following degrees were conferred:—

M.D.—H. V. Dicks and G. W. Bamber.

M.B., B.Chir.—*C. I. C. Gill, R. E. Barnsley, and J. D. Simpson.

M.B.—F. A. Richards, E. J. Pye-Smith, R. L. Osmaston, and B. C. Tate.

B.Chir.—*A. C. Crooke, *H. W. Sadlier, R. S. Stacey, B. C. Nicholson, P. G. Levick, V. P. Paxon, I. J. Franklen-Evans, and J. S. S. Fairley.

* By proxy.

Mr. Eric Gordon Holmes, M.A., M.B., B.Chir., has been elected a non-stipendiary Fellow of Downing College. He was formerly a scholar of Christ's College and a student at St. Bartholomew's Hospital. In 1926 he was appointed assistant to the Downing Professor of Medicine, and is engaged in research.

St. Bartholomew's Hospital and College.

The Old Students' annual dinner will be held in the great hall of the hospital at 7 P.M., on Wednesday, Oct 1st, with Mr. L. B. Rawling in the chair.

Tour of Medical Italy.

The annual medical tour to spas and other health resorts in Italy, organised by the Italian State Tourist Department, will take place from Sept. 10th to 26th. Among the places to be visited are Merano, Carezza (Karersee), and other Dolomite resorts, Riva and Gardone on Lake Garda, Montecatini and Viareggio. An English-speaking Italian doctor accompanies the party. Full information from the Italian Travel Bureau, 16, Waterloo-place, London, S.W.1.

The late Mr. J. T. Ainslie Walker, F.I.C., F.C.S.

The sudden death occurred of Mr. J. T. Ainslie Walker on July 27th. He was educated at Watson's Boys' College and at Edinburgh University, where he studied mainly chemistry. His researches into the values of disinfectants and antiseptics, conjointly with the late Samuel Rideal, resulted in the Rideal-Walker coefficient test for standardising bactericidal powers. During the war he was in charge of a mobile laboratory, and gave special attention to the outbreaks of dysentery which occurred from time to time, and to the treatment of the disease by intestinal antiseptics. The outcome of this work was the introduction to the medical profession in 1922 of the benzene derivative which he christened dimol. He gained a commission with the rank of Captain in the war, and was one of the few non-medical members of the Royal Society of Medicine.

North Staffordshire Royal Infirmary.

Sir Harold Gillies recently opened two operating theatres at this institution, one of which, the joint gift of Mrs. Montford and Mr. Henry J. Johnson, is entirely new, while the other has been reconstructed. The need is indicated by the fact that last year there were 3512 operations upon in-patients, and a total of nearly 13,000 minor operations.

Arundel Hospital.

Sir William Bird, J.P., presiding at a meeting of the governors, announced the gift of £5000 from Miss K. Mitchell for the erection of a new hospital. An appeal has been launched for the raising of the balance required—£2000. The new institution is to be a cottage hospital on a pavilion plan, and will be erected on a site given by the Duke of Norfolk on the Arundel-Chichester road.

Royal Microscopical Society.

This Society, whose headquarters were in Hanover-square, London, for some 40 years, has now moved to the B.M.A. House, Tavistock-square, London, W.C. 1, where its library and slide collections will be more adequately housed, and where a portion of its unique collection of historical instruments will be on permanent exhibition. The ordinary meetings will be held as hitherto on the third Wednesday in each month from October to May inclusive in the Hastings Hall, and by the almost unanimous vote of the Fellows these meetings will be held at 5.30 P.M. instead of at 8 P.M. as formerly. Sectional meetings will be held in the Pillar Hall.

Reunion of the Romance Medical Press.

The second annual gathering of the Federation of the Presse Médicale Latine will be held at Brussels from Sept. 28th–30th, during the centenary commemoration of Belgian independence. The reunion will have the patronage of the Minister of Science and Art and will be presided over by Prof. Maurice Loeper and Dr. Albert Delcourt, presidents respectively of the French and Belgian associations. On the first day of meeting Prof. Emile Forgue, of Montpellier, will open a discussion on the Contemporary Medical Journal and Medical Journalist, the afternoon being given up to considerations of finance and transport. On the second day three interesting topics come up for discussion: (1) the rights of editors of periodicals, (2) the issue of a dictionary of medical terms, and (3) the rôle of the medical press in the diffusion of large scientific and professional ideas. On the third day the delegates will make a comprehensive tour including the Antwerp Exhibition. The general secretary of the congress is Dr. René Beckers, who may be addressed at 36, Rue Archimède, Brussels.

Enlargement of Carshalton Hospital.

The Carshalton, Wallington, and Beddington War Memorial Hospital has been enlarged by the addition of a women's ward of 14 beds, an isolation ward, two children's wards, and 15 private wards. The hospital now contains about 60 beds. A nurses' home is being given by Major Mallinson, at a cost of £5000.

Coombe Lying-in Hospital.

The clinical report of this Dublin hospital for 1929 makes the familiar remark that some of the deaths could have been prevented by efficient antenatal care; nevertheless the morbidity-rate was "reasonably low"—3·8 per cent. The attendance at the prenatal clinics is rapidly increasing, but the "emergencies" far outnumbered the booked cases.

Donations and Bequests.

Mrs. Mary Ann Major, West Cliffe-road, Bournemouth, widow of Herbert Coddington Major, M.D., left £1000 to the Royal Medical Benevolent Fund, £500 each to the West Riding Medical Charitable Society, the Royal Infirmary for the Blind, Frisinghall, the Distressed Gentlefolks' Aid Society, £200 to the Bedford County Hospital, £100 to the Home for Infirm and Aged Women (Jersey), and £100 each to the Jersey Female Orphan Home and the Jersey Society for the Blind.—Among other bequests the late Mr. Joseph Sawyer, of Kenley, Surrey, left £1000 to the Purley Cottage Hospital.

Royal Northern Group of Hospitals.

In addition to the Royal Northern Hospital at Holloway, this group comprises the Royal Chest Hospital, City-road, the Grovelands Hospital, New Southgate, and the Reckitt Convalescent Home at Southend-on-Sea. At the Royal Northern Hospital and its branches, 5752 new in-patients were treated, and the new out-patients numbered 54,196. The enlargement and reconstruction of the out-patients' department is a pressing need. At the Chest Hospital 604 in-patients were treated, and there were 34,579 out-patients' attendances. At the Grovelands Hospital 1315 patients were treated, and at the Reckitt Convalescent Home 637. Since the establishment of the Contributors' Certificate Fund, in 1921, it has collected over £38,000. The general debt of the hospital is now £97,331. The new private hospital for 65 paying patients will cost £57,000 of which £35,000 has been given, and £15,000 lent by Sir Howell J. Williams.

King Edward VII. Welsh National Memorial Association.

At the annual meeting of the Board of Governors held at Carmarthen the President, Mr. David Davies, said that there had been a net decrease of 61 in the number of deaths from tuberculosis in Wales and Monmouthshire, the decrease being most marked in Glamorgan, Monmouthshire, and Carnarvonshire. A high percentage of cases—roughly half—of those referred to the Association were found to be non-tuberculous. Increasing use was made, both in pulmonary and surgical cases, of the trained specialists and equipment provided by the Association. Prof. Lyle Cummins had expressed the view that, in the fight against tuberculosis, the most favourable field for further progress lay in the period of childhood and adolescence, and Dr. R. J. Matthews had confirmed the fact that the critical years in tuberculosis are those of adolescence. This conclusion emphasised even more strongly the importance of the educational campaign in elementary schools.

A Friendly Society Congress.

The ninety-fifth annual high court of the Ancient Order of Foresters, which brought some 800 delegates to Greenock last week, was addressed by Mr. W. Adamson, Secretary of State for Scotland, who said that he was watching the increasing expenditure on sickness and disablement claims with great anxiety. While legislation might be required to bring schemes of social insurance into a complete whole, yet even now much could be done, he thought, by whole-hearted coöperation between all engaged in the service. Mr. A. Marsden, in his address as High Chief Ranger, spoke with satisfaction of a surplus of £1,750,000 in the voluntary section and one of £2,750,000 on the State side. The position of panel doctors had, he said, been made more difficult by the reduction in the interval necessary for removal from one panel to another, and he believed the present procedure placed an undue strain upon the conscientious doctor. Mr. Marsden mentioned two features which in his opinion had won for the insurance principle the confidence of the insured population: (1) freedom to manage their own health insurance affairs by themselves or their representatives, and (2) in the case of friendly societies, liberty to deal with their own brethren in times of sickness and need. The court rejected the proposal that surpluses should be pooled and refused to urge the Minister of Health to make ophthalmic and dental treatment statutory benefits.

Adult Orthopædic Patients.

Adult patients are now being admitted to the Derbyshir County Council's Orthopædic Hospital at Bretby, whic has hitherto been used for children only. A single-store building has been added containing 32 beds, divided equall between men and women. The hospital will continue t specialise in cases of surgical tuberculosis.

Central Hospital for Durham.

The Durham county council has approved a scheme fo the erection of a central hospital to serve the whole of th administrative county. Two adjoining estates, extendin to 62 acres, on the northern boundary of Durham City, ar to be purchased at a cost of £22,000. It is officially state that "practically all the old poor-law hospitals are inadequat and out of date."

Sussex Provident Scheme.

The list of amounts paid to local hospitals in connexio with this scheme for services rendered to subscribers durin the first six months of this year marks a total of £7410 2*s.* 9*d.* or £1361 17*s.* 7*d.* more than for the correspondin half-year of 1929. The Royal Sussex County Hospita received £2992; Royal Alexandra Hospital for Sick Children £873; New Sussex Hospital for Women and Children £709; Hayward's Heath Hospital, £457; Hove Hospital £404; Sussex Maternity and Women's Hospital, £307 Sussex Eye Hospital, £201. Among other payments mad to coöperating institutions and agencies was the sum o £276 to the Brighton Corporation. The Queen's Nurse are in the list for the first time.

Fellowship of Medicine and Post-Graduate Medica Association.

There are two weeks remaining of the special cours arranged by the Fellowship of Medicine at the All Saints Hospital in Genito-Urinary Diseases. Instruction consist of clinical cystoscopic demonstrations on men and women From Sept. 1st to Sept. 13th the staff at the Queen's Hospital Hackney, will provide an all-day course in diseases o children, where a variety of cases will be shown. The annual revision course at the Westminster Hospital will b held from Sept. 15th to Sept. 27th. Teaching will b given in all departments of the hospital. Courses arranged for October include those on diseases of the throat, nose and ear, diseases of children, gynæcology, tropical medicine orthopædics, and a general course (revision), also evening courses for the M.R.C.P. and the Final F.R.C.S. examinations Post-graduates are invited to apply to the Fellowship o Medicine, 1, Wimpole-street, London, W. 1., for particulars of the winter programme, the list of 1931 special courses and the "general course" provided by the associated hospitals.

School Hygiene in Ireland.

At the Trade Union Congress held in Sligo recently a lively discussion took place on the condition of the primary schools as affecting the health of the children. Mr. Frisby, of the National Teachers' Organisation proposed a resolution calling on the Government to make a radical improvement in the conditions of the school buildings and to provide for their sanitation and upkeep. He said that in every county one could see schools which were ill-built and insanitary, a menace to the health of both children and teachers. There could be no effective education in such schools. Senator Cummins drew attention to the fact that the School Meals Act only applied to urban areas, and said that in country districts children who came long distances often had to go hungry all day. The listlessness due to long fasts made it difficult for such children to learn. It is not easy to understand why the School Meals Act is limited to urban areas, as the need for it is quite as great in the country. One of the unanimous recommendations of the committee of inquiry on health services was that the Act should be made applicable in rural as well as urban areas.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 18th, to SATURDAY, August 23rd.—ALL SAINTS' HOSPITAL, Vauxhall Bridge-road, S.W. Afternoon and Evening Course of Clinical and Cystoscopic Demonstrations (Male and Female). Two weeks. Further particulars from the Fellowship of Medicine.

Appointments

BRUCE, C. D., M.B., Ch.B. Edin., has been appointed Medical Officer of Perth Prison and Medical Superintendent of the Criminal Lunatic Dept. State Institution for Defectives.

RUSSELL, BEDFORD, B.Chir. Camb., F.R.C.S. Eng., Surgeon in Charge of the Throat Dept., St. Bartholomew's Hospital.

WALKER, G. F., M.D., Ch.B. Leeds, Hon. Physician, Royal Infirmary, Sunderland.

WATSON, R., B.Chir., Camb., L.R.C.P. Lond., M.R.C.S., D.P.H., Assistant Medical Officer and Assistant School Medical Officer, Doncaster.

Vacancies

For further information refer to the advertisement columns.

Bath, Royal United Hospital.—Asst. H.S. At rate of £120.

Bedford County Hospital.—Asst. H.S. £130.

Birkenhead County Borough Infirmary, Tranmere.—Res. Asst. M.O. £350.

Birkenhead General Hospital.—H.P. Also Cas. O. Each at rate of £100.

Birmingham, City of, P.H. Dept., Tuber. Section.—Asst. M.O. £350.

Birmingham, Highbury Hospital, Moseley.—Res. Asst. M.O. £300.

Birmingham, Midland Hospital, Easy Row.—H.S. £200.

Birmingham, Queen's Hospital, Medical School.—Med. Reg. £200.

Blackburn Royal Infirmary.—3rd and 4th H.S.'s. £175 and £150 respectively.

Bradford City, Municipal General Hospital, St. Luke's.—H.P.'s and H.S's. Each at rate of £200.

Carlisle, Cumberland Infirmary.—2nd H.S. Also H.S. to Special Depts. Each at rate of £155.

Cheshire County Council.—Deputy County M.O.H. £1000.

Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100–£175.

Chester Royal Infirmary.—H.P. and H.S. Each £150.

Colchester, Essex County Hospital.—Asst. H.S. and Reg. £120.

Connaught Hospital, Orford Rd., Walthamstow, E.—Sen. Res. H.S. At rate of £150.

Coventry and Warwickshire Hospital.—Res. H.P. Also Res. Cas. O. £160 and £125 respectively.

Croydon County Borough, Public Assistance Dept.—Res. Asst. M.O. for Mayday-road Hospital. £300.

Denbigh, North Wales Sanatorium, Llangwyfan.—3rd Asst. Res. M.O. £250.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.

Dewsbury, New Dewsbury and District General Infirmary.—Jun. H.S. £150.

Dorchester, Dorset County Hospital.—H.S. £160.

Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £160.

Dumfries and Galloway Joint Sanatorium Board.—Asst. Med. Supt. £300.

Durham County Council.—Asst. Welfare M.O. £500.

Edinburgh, Jordanburn Nerve Hospital, Morningside Park.—Asst. Phys. £400.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.

Gloucester County and City Mental Hospitals.—Jun. Asst. M.O. £350.

Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. At rate of £150.

Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. £150 and £140 respectively.

Guy's Hospital, Dental School, London Bridge, S.E.—Teacher of Conservative Dental Surgery. £1000.

Halifax Royal Infirmary.—3rd H.S. £125.

Hertford County Hospital.—H.P. At rate of £150.

Ilford, King George Hospital.—Res. M.O. £200.

Infants Hospital, Vincent-square, Westminster.—Two H.P.'s. Each at rate of £75.

Inverness, Northern Infirmary.—H.P. and Jun. H.S. £100.

Leicester Royal Infirmary.—H.S.'s and Cas. O. Each £125.

Liverpool Eye and Ear Infirmary, Myrtle-street.—Hon. Asst. S. to Ear, Nose, and Throat Dept.

Liverpool Open Air Hospital for Children, Leasowe.—Jun. Res. M.O. £200.

Liverpool, Public Assistance Committee.—District M.O.'s. Each at rate of £250.

Liverpool, Walton Hospital, Mill-road Infirmary, Smithdown-road Institution, and Alder Hey Children's Hospital.—Res. Asst. M.O.'s. Each £200.

Leeds Jewish Herzl-Moser Hospital.—Res. M.O. £100.

London, County of.—Coroner. £1700.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.

London Hospital, E.—Surgical 1st Asst. and Registrar. Also Medical 1st Asst. and Registrar. Each £300.

London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200. Also Two Surg. Regs. Each £100.

Manchester Joint Committee on Cancer Research.—Asst. in Cancer Research Laboratories. £400–£650.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Merthyr General Hospital.—Res. H.S. At rate of £150.

Middlesex Hospital, W.—Medical Men interested in Radium Treatment of Malignant Disease.

Miller General Hospital, Greenwich-road, S.E.—Cas. O. £150.

Newcastle-upon-Tyne, Hospital for Sick Children.—Hon. Asst. Surgeon.

Newcastle-upon-Tyne, Royal Victoria Infirmary, Pathological Dept.—Bio-chemist. £450.

Oldham Royal Infirmary.—Two H.S.'s to Special Departments. Each at rate of £175.

Preston and County of Lancaster Royal Infirmary.—Two H.S.'s. Each at rate of £150.

Rochdale Infirmary and Dispensary.—Jun. H.S. £175.

Royal Air Force Medical Service.—M.O.'s.

Royal College of Physicians.—Milroy Lecturer.

St. John's Hospital, Lewisham, S.E.—Res. Cas. O. At rate of £100.

St. Pancras Metropolitan Borough.—Asst. M.O. £500.

Salford, Hope Hospital.—Res. Surg. O. £400.

Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.

Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.

Southampton, Royal South Hants and Southampton Hospital.—Two Asst. H.S.'s. Each at rate of £180.

South Shields, Ingham Infirmary.—Jun. H.S. £150.

Stafford, Staffordshire General Infirmary.—H.S. and H.P. At rate of £200 and £150 respectively.

Swansea County Borough, Infectious Diseases Hospital.—Res. M.O. £350.

Taunton and Somerset Hospital.—H.P. £100.

Ventnor, Royal National Hospital for Consumption, &c.—Asst. Res. M.O. At rate of £300.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.S. At rate of £100.

Walsall Manor Hospital.—Res. Asst. M.O.'s. £200 and £150 respectively.

Warwick County Mental Hospital, Hatton.—Jun. Asst. M.O. £350.

West London Hospital, Hammersmith-road, W.—H.P., Two H.S.'s., and Res. Anæsthetist. Each at rate of £100.

Wolverhampton Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £125.

Births, Marriages, and Deaths

BIRTHS.

CHARTERS.—On May 9th, at Namirembi, Uganda, the wife of A. D. Charters, M.B., B.Ch., of a son.

CORY.—On August 7th, at Guildhall-street, Bury St. Edmunds, the wife of Dr. J. W. E. Cory, of a son.

DOWELL.—On August 2nd, at the Royal Infirmary, Derby, the wife of W. H. Dowell, M.R.C.S., L.R.C.P., of Castle Donington, of a son.

DURRANS.—On August 5th, at Cornelia Hospital, Poole, Dorset, to Margaret Durrans, wife of S. F. Durrans, M.R.C.S., L.R.C.P.—a son.

FITZSIMONS.—At "Tattysallagh," Caerleon, Mon., to Sheila, wife of Dr. J. O'C. Fitzsimons, of Naas, Co. Kildare—a daughter.

MILLS.—On August 10th, the wife of James Denholm Mills, B.M., B.Ch., of Shortlands, Seaford, Sussex, of a son.

THOMSON.—On August 2nd, at Woodland House, Penrith, the wife of Douglas D. C. Thomson, M.R.C.S., L.R.C.P., of a daughter.

MARRIAGES.

GILLESPIE—HOWARD.—On August 9th, at St. Columba's (Church of Scotland), Pont-street, S.W., R. D. Gillespie, M.D., M.R.C.P., to Audrey Margaret Mary, elder daughter of the late C. R. Howard, M.D., O.B.E. (Milit.), Frome, Somerset, and Mrs. Philip F. Howley, London.

DEATHS.

BRAUND.—On August 3rd, Arthur Mather Braund, M.R.C.S., L.R.C.P., of Hillside, Stratton, North Cornwall.

BROOK.—On August 10th, at Pottergate, Lincoln, Lieut.-Colonel Charles Brook, F.R.C.S., R.A.M.C. (T.) (retired), in his 92nd year.

LLOYD.—On August 6th, Frederick George Lloyd, M.R.C.S. Eng., L.R.C.P. Lond., of Oakwood-court, W., aged 65.

REES-THOMAS.—On August 9th, at Cross-street, Basingstoke, William Henry Rees-Thomas, M.D., M.R.C.S., L.R.C.P., aged 60.

THOMSON.—On August 8th, on R.M.M.V. *Alcantara* in South Atlantic, Emmeline Sibyl, wife of F. G. Thomson, M.A., M.D., F.R.C.P., of 28, Circus, Bath. Buried at sea, August 9th.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I., 1930.

THE Index and Title-page to Vol. I., 1930, which was completed with the issue of June 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NOTES, COMMENTS, AND ABSTRACTS

THE AUSTRALIAN CANCER ORGANISATION.

By Arthur Burrows, M.D., M.R.C.P., D.M.R.E.,
RADIUM AND CANCER ADVISOR TO THE COMMONWEALTH GOVERNMENT.

(*Concluded from p. 331.*)

A GENERAL CONFERENCE.

In the beginning of April, 1930, the first annual conference of the cancer organisations in Australia was held at Canberra. This conference, which was well attended and enthusiastic, discussed such subjects as the progress made in the cancer campaigns in the various States, the organisation of the treatment of cancer by special physical and chemical methods and the results obtained thereby, possible avenues of research in respect of cancer, the evaluation of the various methods of treatment of cancer, and the organisation of the national resources against cancer. It was called by the Minister for Health and an official report of its deliberations will appear in due course.

It was the misstatement of some of the facts and figures brought forward at this conference which led to certain erroneous paragraphs in respect of the cure of cancer in Australia being inserted in the Australian and English lay press. The statements as they appeared in the daily press were given a somewhat sensational turn and were not actually in accord with the reports officially presented and discussed at the conference.

RESULTS OF TREATMENT.

The general position is as follows. Until the end of 1929 (a period which, allowing for different dates of starting, averages out at roughly a year of activity for the whole of the Australian centres) over 3000 cases were treated at the newly constituted cancer centres, of which approximately 2500 were treated by radium. One of the hospitals in Australia which became a radium centre already possessed equipment with deep X ray apparatus, and one or two others at the date of the conference were still waiting for delivery. So that, in the case of Melbourne, the numbers of patients treated at the cancer centre did not include those who were treated by deep X rays alone, but the figures are available for the deep X ray cases treated at the Royal Prince Alfred Hospital, Sydney. The number of cases treated at each centre is roughly proportional to the population of each State and about 8 per cent. of the 2500 cases treated were not malignant.

It was not possible to analyse the results obtained from returns of cases treated right up to date, but the figures of the patients treated up to June 30th, 1929, were analysed by me. At the time that these figures were given it was stated definitely that the word "cure" could not be used, and that it was certain that a very considerable proportion of the cases quoted as "well" would recur in due course. The expression "well" that was used is substantially the same as the term "clinical cure" which is often used in America, and means that no symptoms or signs of the disease could be detected at the date on which the returns of the case sheets were made. The analysis of the patients treated by radium was presented simply with the object of giving some idea of how the work was progressing up to date, and represents merely the early work done at the cancer centres, with the exception of Adelaide, which started late.

It has not been possible to produce all at once groups of experienced radium therapists everywhere in Australia, even though a full post-graduate course has been given at the Sydney University, and a considerable amount of individual instruction t the various State centres and sub-centres. Wh the work which is set forth in the following table w carried out, some of the medical men were ju emerging from the student stage of radium wo

General Figures.

Malignant disease.	Total.	No information, not improved, or died.	Improved.	Well at date.	Prophy-
Carcinoma cervix uteri ..	85	38	26	21	—
,, vagina ..	10	4	3	3	—
,, corpus uteri..	3	2	1	0	—
,, skin	98	31	25	42	—
,, lip	46	10	9	26	1
,, tongue ..	40	23	12	5	—
,, buccal cavity.	59	36	15	8	—
,, pharynx ..	5	4	0	1	—
,, larynx ..	16	11	3	2	—
,, bladder ..	8	5	3	0	—
,, prostate ..	6	5	1	0	—
,, rectum ..	14	8	4	2	—
,, breast ..	20	6	11	2	1
,, glands* ..	25	15	9	1	—
,, various ..	8	4	2	2	—
Sarcoma	34	21	8	5	—
Malignant disease, various	6	1	2	3	—
	483	224	134	123	2
Rodent ulcer	245	22	36	187	—
Benign conditions ..	118	5	35	78	—
Grand total ..	846	251	205	388	2

* These glands are chiefly advanced secondary glands occurri after the primary growth had been removed by surgery at so earlier date.

The work is steadily improving and is better the present time than it was at the period which th table covers. It, however, still leaves something be desired and efforts are being made in all directio to ensure improvement.

COMMENT ON THE RESULTS.

The results in the treatment of carcinoma of t tongue and buccal cavity are disappointing, but it h not been possible to indicate the considerable numb of cases in which the primary growth disappear under radium treatment. The majority of the cas which did not improve were unsatisfactory owing t the development of secondary glands.

In Australia, as apparently in England, the idea burying radium needles is the thing which has appeale most to the general medical imagination and it h been difficult, possibly because it needs more technic knowledge, to induce the centres to develop to th extent necessary the application of radium from th surface. Certainly our results from the treatment secondary glands show quite well, when the cas sheets are examined, that the burying of radiu needles in secondary squamous-celled cancer gland in the neck is almost useless. Carcinoma of the ski also shows considerable scope for improvement, bu it must be remembered that, in the first instanc through the necessity of circumstances, many advance cases were treated, as well as patients who ha previously received radiation treatment which ha rendered them radio-resistant.

The obligation of attempting to cure all cases in on treatment and with it the correlated duty of providin only the very best treatment for every cancer cas in the first instance is steadily being taught an inculcated into the minds of the medical practitioner carrying on the radium work.

Carcinoma of the cervix shows 25 per cent. o immediate apparently perfect results. This relativel low figure probably arises from the fact that in number of instances it has been difficult to restrai the inexperienced radiotherapist from changin

pidly from one technique to another instead of rrying out one method thoroughly. Efforts are ing made to straighten out this difficulty, and to ve an example of what can be done even now; at isbane General Hospital, where a very considerable mber of cases of carcinoma of the cervix were ated and one technique was almost constantly plied, 50 per cent. of the cases treated showed no gns or symptoms of the disease after nine or more nths—that is, up till April, 1930.

The total number of cases which showed no signs symptoms of malignant disease nine or slightly re months after radium treatment, excluding dent ulcer, was 123. This represents nearly one-arter of the patients treated. How many of these ses will remain permanently well time alone will w, but it is certain that a proportion of them will e on without recurrence.

Deep X ray treatment has also given some very tifying results, which is all the more pleasing king to the fact that this work was started and rried on in Australia despite a considerable spondency and often opposition.

An attempt is being made to have microscopic amination made of every tumour examined. ing to deficient facilities in one or two centres s has not been done as completely as desired, but hin a month or two it will be possible for every tre to examine every case histologically. So half the cases have had microscopic examinations de although, as has above been indicated, this is t as high a proportion as will shortly be possible. t what can be done in this matter has again been wn at Brisbane General Hospital where, in 99 of a group of 119 cases of serious cancer treated, tions for pathological examination were prepared l reported upon.

The question of the follow-up of cases after treat-nt is giving some little difficulty in certain quarters, the number of cases so far that have been missing omparatively small. Again in this respect Brisbane s an example, as in the case records for that centre ainst the names of only two patients was it found essary to insert the statement "no information ained."

THE FUTURE.

So far it can certainly be said that the Australian periment in cancer treatment and organisation s been fully justified, and a very large number of ple who would not otherwise have obtained it e been completely or partially relieved of the nptoms or signs of cancer, and it is generally felt t this work has been all to the good with a definite mise of steady progress in the future. In all tres the predominant feeling is one of hopefulness l confidence. There now remains the necessity for intaining and improving the standard of cancer atment throughout Australia by the control and provement of old techniques together with the roduction of new ones. It is also necessary that this at national experiment should be maintained as a ty and that the whole organisation should be t on its present basis, by which means uniformity methods of treatment, of recording cases, and of owing-up results will be maintained and any new hods, both from home and abroad, brought rapidly he notice of the various centres.

The organisation that has been laid down is the leus of a great scheme and represents an attempt deal with the cancer problem on modern lines by hods which bring to bear on the question both ional and local powers of organisation and iative.

XTENSIONS AT PAPWORTH SETTLEMENT.—ce George has opened the large new cabinet-making , the foundation-stone of which was laid a year ago the Duke of York, at Papworth Village Colony. His al Highness commented upon what he described as the traordinary fact" that not a single child of the married rculous members of the colony has suffered from rculosis.

THE NATURE OF MILTON'S BLINDNESS.

THE conjectural diagnosis of the cause of Milton's blindness is an interesting exercise to which an article is devoted by Mr. Arnold Sorsby in the July number of the *British Journal of Ophthalmology*. The known facts are briefly as follows. In the first place we know that the blindness was not due to any externally visible affection. In the sonnet addressed to his friend Cyriak Skinner, Milton says:

> "Cyriak, this three years' day these eyes though clear
> To outward view, of blemish or of spot,
> Bereft of light, their seeing have forgot."

As a boy Milton was so studious that from the age of 12 he scarcely ever went from his lessons to bed before midnight "which indeed was the first cause of injury to my eyes, to whose natural weakness their were also added frequent headaches." Nevertheless in his early years he was skilled in using the sword, so that the defect of sight at that time could not have been very great. It was not until about the age of 35 that the trouble with his eyes became very serious, but even then he would not spare himself. He says:

> "When I was publicly solicited to write a reply to the defence of the royal cause; when I had to contend with the pressure of sickness and with the apprehension of soon losing the sight of my remaining eye; and when my medical attendants clearly announced that if I did engage in the work, it would be irreparably lost—their premonition caused no hesitation and inspired no dismay."

In describing the onset of his blindness in a letter intended to be shown to Dr. Thevenot, a Parisian oculist of great repute, he says, writing in 1654, when he had been blind for about three years:

> "It is ten years, I think, more or less since I felt my sight getting weak and dull, and at the same time my viscera generally out of sorts. In the morning if I began as usual to read anything, I felt my eyes at once thoroughly pained, and shrinking from the act of reading, but refreshed after moderate bodily exercise. If I looked at a lit candle a kind of iris seemed to snatch it from me. Not very long after a darkness coming over the left part of my left eye (for that eye became clouded some years before the other), removed from my vision all objects situated on that side. Objects in front also, if I chanced to close the right eye, seemed smaller. The other eye also failing perceptibly and gradually through a period of three years, I observed some months before my sight was wholly gone, that objects I looked at without myself moving, seemed all to swim, now to the right, now to the left."

From this passage, and especially from the mention of a "kind of iris" when he looked at a candle, some writers have argued that Milton's disease was chronic glaucoma. As Mr. Sorsby points out, however, it is a large assumption that the expression "kind of iris" alludes to the rainbow colours round lights which are sometimes seen in glaucoma, and the age of onset—the early thirties—as well as the nature of the field defect, occurring suddenly, and temporal, not nasal, in position—are distinctly against that diagnosis.

On the other hand, there is good reason to believe that Milton suffered from progressive myopia. The early trouble with his eyes brought on by excessive study points to this. Later, the sudden loss of the temporal field in his left eye suggests very strongly a detachment of the retina in that eye. It was three years after the loss of sight in the left eye that the right one appears to have followed suit. Its gradual failure and Milton's own description of the swimming about of objects, culminating in complete blindness save for perception of light, suggests a progressive myopia leading to a retinal detachment. This presumption is strengthened by the knowledge that Milton in his youth had trouble with his eyes connected with overwork. We may presume that he was born with an hereditary tendency to myopia (his father, we are told, read without spectacles at the age of 84); that his studious life favoured the development of the myopia and of the choroido-retinal degeneration that so often attends it; that the sudden failure of vision in the left eye was due to retinal detachment; and that the gradual failure of the right, though it

may have been due solely to retinal degeneration, was very probably completed by a second detachment. The theory of detachment was first mooted by Dr. Dufour, of Lausanne, in 1909. Mr. Sorsby discusses other theories, but we agree with him that this one is by far the most probable.

A MEMORIAL TO MARGARET MACDOWALL.

To the Editor of THE LANCET.

SIR,—It has been suggested by some of those who knew and admired Margaret Macdowall and her work for children of limited intelligence, that many might care to subscribe to a memorial. It is thought that such a memorial might take the form of a new edition of her book, "Simple Beginnings in the Training of Mentally Deficient Children." This book, which was first published in 1919, and is still in constant demand, has now been out of print for some time, and it is estimated that a new edition, with some biographical notes added, would cost approximately £100. If, as is hoped, the response to this appeal brings in a substantial sum, it is proposed to use the balance, and any proceeds from the sale of the book, to create a fund from which grants or loans could be made to help educated girls to train for work among mentally deficient children. Mr. Harold Moreland has kindly consented to act as treasurer of the fund, and will acknowledge any donations, large or small, sent to him at Cherrycroft, Gerrards Cross, Bucks. The fund will close on Oct. 31st.

We are, Sir, yours faithfully,

R. COCKBURN.	BERTHA JAMES.
MAURICE CRAIG.	E. F. PINSENT.
EVELYN FOX.	A. F. TREDGOLD.

August 12th, 1930.

ULCERS OF THE SKIN.

THE first two papers in the July number of the *Archiv für Schiffs- und Tropen-Hygiene* describe unusual cases of ulcer of the skin. On p. 345 Dr. H. Ziemann and Dr. A. Waegener tell of a German planter in Portuguese East Africa, aged 28, who in April, 1927, fell into a ditch and grazed his right knee externally. In a fortnight the wound began to inflame. The local doctor treated him with two intravenous injections of neosalvarsan, and with caustic and permanganate, but ultimately he had to come home, and in June, 1928, came under care in hospital in Berlin. There were several ulcers on the outside of the knee, extending along the lower third of the thigh and the upper end of the leg, the edges of the ulcers were pigmented and rolled, many suppurating pockets were found, and the knee was flexed to an angle of 130°. Serial photographs reproduce the appearances (at first very discouraging) from time to time. All kinds of treatment were used, drugs, X rays, sunlight, autovaccines, antiserum, skin grafting, without avail, until on Sept. 26th, Dr. Ziemann found in scrapings, not from the floor but from the edge where there was no suppuration, leishmania parasites, when he ordered an intravenous injection of stibenyl 0·1 g. to be given. This very small dose caused a severe reaction—collapse and later albuminuria with casts. Four days later 0·01 g. stibenyl was given intramuscularly, and as tolerance increased the dose was raised to 0·3 g. The ulcers were dressed with philonin ointment (copper iod-ortho-oxychinolin-sulphate and silver sulphate, āā 0·1 g., boric acid and acridin, āā 1 g., balsam of peru, 10 g., irradiated cholesterol, 0·25 g., zinc ointment to 100 g.) an ointment said to be very useful for wounds that do not heal. The patient still had reaction from the stibenyl treatment, but his ulcers began to heal rapidly, and he was discharged from hospital on Nov. 2nd, and was later reported completely cured. The authors note that this is the first report of leishmania of the skin from East Africa. They suggest that the original wound was probably infected by a phlebotomus carrying the parasite. The monocytosis in the blood was never higher than 4 per cent. The history of this case shows the importance of seeking leishmania parasites at spots where there is no suppuration.

The other communication (p. 351) is by Dr. Garry, surgeon to a Jerusalem hospital, reporting an epidemic of ulcers on and about the ankle, which occurred in Palestine in 1920. About 10 patients were seen by Dr. Garry, mostly poor people, who came from the coast and walked barefoot. Fusiform bacilli were often present, but could never be cultivated. The ulcer first appeared as a papule the size of a pea, red and tender. Next day there was effusion, occasionally pus, drying to a scab, under which an ulcer formed in two or three days, covered with what sometimes looked like a diphtheric membrane. The ulcers were very painful at night. No lymphangitis was noticeable. They healed spontaneously in about two months. Dr. Garry tried many remedies, the most successful being lactic acid dusted into the lesion under a wet saline dressing. A single application only was needed in some cases. All the ulcers so treated healed within three weeks.

TONSILLECTOMY IN RHEUMATIC FEVER

IN what they describe as a preliminary report[1] William Robey and Dr. Maxwell Finland, of Boston, "unhesitatingly offer tonsillectomy as a safe therapeutic measure" during the acute attack of rheumatic fever, and claim that in several cases "the results have been brilliant." Referring to the figures upon which this double claim is based, one finds that out of 50 cases operated upon during the acute attack no less than 13 (that is, over 25 per cent.) are admitted to have had a definite exacerbation of symptoms. The criteria selected for comparing with the results of ordinary medical treatment are the number of days of elevated temperature, the number of days of joint symptoms, and the duration of the patient's stay in hospital. From the tables presented few conclusions can be drawn; the average duration of joint symptoms is recorded as 40 days in operated and 36 in unoperated cases (which seems very high), while the temperature remained raised in the operated cases for an average of ten and in the unoperated cases of eight days. Thus even if these criteria are regarded as sufficient, they do not provide any basis for the main claims of the paper.

No attempt was made to follow up the cases after discharge from hospital, and apparently the view was taken that the operation may, at least in certain successful cases, be taken as a cure. But the chief characteristic of rheumatic fever is a sudden or, more often, insidious invasion of the heart and nervous system by the causative virus, so that a follow-up of cases over a long period can be the only means of estimating the results of any specific course of treatment. Robey and Finland recognize, indeed, that "an initial attack or a recurrence may take place after tonsillectomy," but even this does not give them pause in "unhesitatingly offering tonsillectomy."

[1] Arch. Internal Med., 1930, xlv., 772.

ROASTING AN OX.—In aid of Loughborough Hospital, an ox has been roasted whole at Kegworth. It weighed 40 st., cost £20, and was roasted and eaten in the field in which it had grazed during its two years of life. The first slice, which was declared to be "well and truly cut," was sold for £4 10s.

LEEDS PUBLIC ASSISTANCE HOSPITALS.—The Leeds public assistance committee has given approval to a scheme for the appropriation of St. Mary's Infirmary, St. James's Hospital, and Rothwell Infirmary for the use of the sick of the city, whether poor or not. St. James's Hospital, which of late years has been used by the guardians as a general hospital, is to be adapted for the treatment of the acutely sick.

ADDRESSES AND ORIGINAL ARTICLES

DIABETES AS A PHYSIOLOGICAL PROBLEM.*

By J. J. R. Macleod, M.B., LL.D. Aberd., F.R.C.P. Lond., D.Sc. (Hon.) Toronto, F.R.S.,
REGIUS PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF ABERDEEN.

LECTURE I.

These lectures give me the opportunity to present a review of certain investigations in experimental diabetes, which have been carried out during the past few years under my direction in the Physiological Laboratory of the University of Toronto. Most of these researches will be dealt with in the first lecture and, in the second one, I shall consider a problem in metabolism which is now coming to the forefront in both laboratory and clinic—namely, the control of the secretion of insulin.

History of Two Depancreatised Dogs.

I shall begin by giving a short account of the clinical history of two dogs which were kept alive by treatment with insulin for about four years after complete removal of the pancreas. The animals remained throughout this time in excellent condition, and death occurred in one of them on the fifth, and in the other on the sixth day after discontinuing insulin. There cannot be the slightest doubt that both dogs would have survived to the full span of their normal lives had the treatment been continued.

I regret now that this plan was not followed. The reason for removing insulin was to determine the intensity of the resulting diabetes by observing, among other things, the behaviour of the respiratory quotient, and it was intended that this should be done on the third and fourth days. Unfortunately, a serious fire broke out in the laboratory on the morning of the third day, and it took all this day to repair damage to the respiratory apparatus. The dogs being as yet apparently unaffected, it was decided to continue with the programme as originally planned, except that the respiratory observations were postponed to the fourth and fifth days. Although we knew from our experience with other similarly treated dogs that we were incurring grave risks of losing the animals from coma, on account of their fattened condition, we expected to be able to guard against this by treatment with insulin immediately any definite symptoms, such as vomiting and drowsiness, showed themselves. But unfortunately, these symptoms only developed after it was too late to save the animals.

During their sojourn in the laboratory, both dogs were under constant observation and each was occasionally used in the first year for experiments relating to diabetes. Several of the results have been published from time to time, and in the clinical histories which I now offer I will indicate where these may be found. It will be convenient if I first of all give an account of each animal during the course of the insulin treatment, and then describe that of the diabetes which supervened when it was discontinued.

1. Dog 23, a female mongrel, weighing about 8 kg., was completely depancreatised on Sept. 17th, 1923, by Dr. F. N. Allan. It was kept on a diet of meat and cane sugar with insulin injections twice daily, on which it maintained its weight fairly well. On March 5th, 1924, it was used by Drs. Allan and Sokhey in their investigations of the effect of diabetes and of insulin on the excretion of phosphorus.[1] On March 8th this observation had to be terminated by giving food and insulin, because of unfavourable symptoms. At this time the dog weighed 7 kg. It was placed on the retired list and raw pancreas was added to its food, in view of the observations of Allan, Bowie, Macleod, and Robinson[2] that this addition prevents the occurrence of serious and often fatal hepatic changes in insulin-treated, depancreatised animals. An amount of sugar considerably exceeding the assimilation limit was also given daily, so that marked glycosuria was always present. This was done in order to avoid risk of the development of hypoglycæmic symptoms in the night, from which other animals had been lost. On Oct. 12th, 1926, the weight had increased to 10·8 kg., and the only fact worth recording during the interval is that the dog on several occasions was mated while in heat, but did not become pregnant. It was now being fed twice daily with 200 g. raw lean meat, 50 g. raw pancreas, and 50 g. cane sugar, and 16 units of insulin were injected before each feeding. A conditioned salivary reflex had become established, so that whenever the attendant approached the cage with the hypodermic syringe in his hands the animal pressed its body against the bars and salivated profusely in anticipation of the feeding which was to follow. From Oct. 12th to 15th, the 24 hours' urine was collected and respiratory observations were made on the 12th and 14th. The average daily excretion of nitrogen was 13·9 g., and of glucose 82·3 g. Assuming that a D : N ratio of 3·65 would have obtained if protein alone had been metabolised, the total glucose intake works out at 156 g. (51 g. from protein and 105 g. from cane sugar), so that 74 g. of glucose was used, and the glucose equivalent † of one unit of insulin was 2·3. On Oct. 6th and 14th the respiratory quotient was 0·86 and the energy expenditure 69 calories per kg. and day; on the 15th these values were 0·83 and 74·5 respectively. There were no ketone bodies in the urine.

About a year later, on Sept. 27th, 1927, another similar metabolic study was conducted by J. J. Weber, the animal during the interval being on the above diet and always in apparently normal condition, very lively and vociferous. At this time it weighed 11·2 kg. Urine was collected daily until Oct. 6th, the average daily excretion of nitrogen being 11·2 g. and the carbohydrate utilisation 136 g., giving a glucose equivalent of 4·25. On Sept. 29th the respiratory quotient was 0·922 and the energy expenditure 78·5 calories per kg. and day; on Oct. 27th these values were 0·904 and 72·3 calories respectively. As judged from the behaviour of both the glucose equivalents and the quotient, the animal was utilising more carbohydrate than it had done a year previously. Similar metabolic studies were again undertaken by Mr. Weber from Oct. 31st to Nov. 4th, and from Nov. 29th and Dec. 6th, with the results given in Table I.

Table I.

1927.	Weight.	Average daily nitrogen excretion.	Average daily glucose utilised.	Glucose equivalents.
	kg.	g.	g.	
Oct. 31st to Nov. 4th.	13·5 to 12·5	13·54	143·4	4·3
Nov. 29th to Dec. 6th.	14·1 to 11·3	13·6	117	3·65

Respiratory analyses were made on two of the days of each period, the average quotient for the first one being 0·906 and the energy expenditure 71·7 calories per kg. and day; for the second period these values were 0·917 and 69·4 calories respectively. No traces, either of ketone bodies or of albumin were found in the urine, which was tested for their presence daily.

2. Dog 32, a female Irish setter, weighing 7·27 kg., was depancreatised by Dr. Allan on Feb. 14th, 1924. The subsequent history of this animal up to March 24th, 1925, has already been published by Markowitz and Simpson.[3 4] The most noteworthy incident during this period was that the dog became pregnant and gave birth on Jan. 1st, 1925, to six pups, three being born dead. The milk flow was good, and the mother suckled the three pups. On Jan. 2nd she developed marked symptoms of hypoglycæmia, and the blood-sugar was found to be 0·067 per cent. Prompt recovery was effected by injection of glucose. Since the dose of insulin and the food intake had not been changed, it was concluded that loss of sugar in the milk, which was

*The Oliver-Sharpey Lectures delivered before the Royal College of Physicians of London on April 29th and May 1st.

† This equivalent is obtained by dividing the grammes of glucose utilised by the number of units of insulin injected.

being secreted plentifully, was responsible for the hypoglycæmia. From now on the blood-sugar concentration was measured daily, and since it did not again reach a dangerously low level, no change was made in the standard diet or the dosage of insulin. On Feb. 1st, 1925, the pups were weaned, and during March the carbohydrate balance of the mother was determined for a period of a week. It is interesting to compare the results at this time with those obtained between Oct. 25th and Dec. 25th, 1924. This is done in Table II.

TABLE II.

Date.	Weight.	Average daily nitrogen excretion.	Average daily glucose utilised.	Glucose equivalent.
1924.	kg. Prior to preg.	g.	g.	
Oct. 25–26 ..	—	13·26	117	3·6
Nov. 24–26 ..	10·8	13·58	126	3·9
Dec. 9–11 ..	11·4 During	13·00	120·4	3·8
„ 16–18 ..	11·9 preg.	11·34	103·5	3·23
„ 22–25 ..	12·6	11·46	113·5	3·54
1925.				
March 3–7 ..	10·0 After	12·2	133·5	4·17
„ 22–24 ..	10·0 weaning.	12·4	121·7	3·8

As pregnancy advanced the excretion of nitrogen declined, due to retention of nitrogen by the fœtuses. At the same time there was a slight falling-off in the utilisation of glucose, which indicates that no significant amount of insulin could have been added to the maternal organism from the fœtal pancreas. After weaning, the carbohydrate balance was practically the same as it had been six months previously.

During the next 18 months the dog was maintained in a perfectly healthy state on the standard diet and the usual insulin dosage. She did not again become pregnant, although frequently mated while in heat. The urine always contained sugar. The next metabolic observation was undertaken by Dr. Chaikoff between Oct. 7th and 13th, 1926, when the dog weighed 12 kg. The average daily excretion of nitrogen was 14·6 g. and the glucose utilised was 126 g., giving a glucose equivalent of 3·9. The average respiratory quotient of two of the days was 0·885, and the energy expenditure 63·9 calories per kg. and day.

Between September and December, 1927, metabolic observations were undertaken by J. J. Weber on three occasions of one week each. The average results for each period were as shown in Table III.

TABLE III.

1927.	Weight.	Average daily nitrogen excretion.	Average daily glucose utilised.	Glucose equivalents.	R.Q.	Calories.
	kg.	g.	g.			per kg.
Sept. 30th–Oct. 6th.	13·0	13·5	134	4·2	0·876	64·5
Oct. 31st.–Nov. 9th.	13·4	15·0	143	4·4	0·903	60·3
Nov. 29th.–Dec. 6th.	13·8	14·45	119	3·7	0·909	60·1

The urine was always found to be free of ketones and protein. The morning blood-sugars on Dec. 9th and 10th were 0·440 and 0·440 per cent. respectively. It is clearly shown that no change had occurred in the assimilative power for carbohydrate, although a large proportion of the available sugar was metabolised.

The remarkable constancy in the metabolic balances over a period of several years in both these animals shows conclusively that no agency could have become developed in the body to alter the assimilative powers for carbohydrate.

The choice of diet was made in the light of various trials on other depancreatised animals. In the first attempts meat alone was fed, but although it was greedily consumed there was a steady fall in body-weight and symptoms of poor nutrition usually supervened. On this diet, however, Banting and Best [5] succeeded in keeping a dog in good condition for over two months, when it was killed. To prevent the emaciation, cane sugar was added to the diet (with corresponding increase in insulin dosage), but although this had the desired effect and anima could now be kept alive for periods up to eight month they ultimately succumbed to a condition in whic symptoms of acute jaundice were prominent; th was found on post-mortem examination to b associated with extreme fatty changes in the live There was also during life evidence of very imperfec digestion of the food, the fæces containing muc undigested muscle-fibre besides large quantities fat. Believing that the absence of pancreat ferments, upon which this inadequate digestio obviously depended, might be related to the hepat changes, it was decided to add raw pancreas (50 g.) the daily diet. The resulting improvement, both the condition of the fæces and the general well-bein of the animals, was very striking. The experien of M. E. Hédon [6] corroborates ours, but that Penau and Simonnet [7] does not. These worke succeeded in keeping a depancreatised dog for 74 days on insulin and a diet composed of meat, milk, an bread, with powdered lime. Hershey, in the Toron laboratory, has been investigating this problem, an by feeding easily digestible fats, particularly lecithi has succeeded in keeping several depancreatised do alive for considerably over eight months, but w must await his report before we can say wheth healthy survival is possible without administratio of pancreas. My impression is that dogs may va and that their ability to survive is related to th presence or absence of nodules of pancreatic tissue the submucous layers of the duodenum. Bowie has found that, in about 50 per cent. of both norm and depancreatised dogs, pancreatic nodules can detected in the duodenal wall, closely associated wi the pancreatic ducts. These nodules do not conta islet tissue, but they may secrete into the intesti just sufficient pancreatic juice to have a favourab effect on digestion.

The fattening effect of insulin and sugar is usual very marked in depancreatised animals, and w early noted in rabbits that were repeatedly used f the assay of insulin, especially when sugar had al to be given because of convulsions. In norm animals, however, the fattening does not contin for long, even although the insulin and sugar a continued, as we have shown by carefully controll observations on pigs at the Rowett Institute (Mage Macleod, and Middleton [11a]). In animals of su normal weight, on the other hand, the treatment m be of value.

PREGNANCY DURING DIABETES.

Our failure to detect any influence of pregnan on the diabetic symptoms of dog 32 prompt Markowitz and Soskin [8] to repeat the observatio on other animals with equally negative results. two dogs that were depancreatised during the lat stages of pregnancy, and thereafter given small dos of insulin, the partial diabetes which supervened w as severe as after pancreatectomy in non-pregna animals. These results are apparently at varian with those obtained by Lawrence [9] in the case of diabetic woman. During the first 27 weeks of t pregnancy the diabetes was severe, and the patie required 44 units of insulin a day, but it improv greatly during the following 10 weeks, at the end which Cæsarean section had to be performed account of nephritis. Just before the delivery (twins) the carbohydrate tolerance had increased far as to make it unnecessary to give insulin, a Lawrence computed that 100 g. more of carbohydra could be tolerated than before the pregnancy. Aft delivery the diabetic condition became worse agai The record certainly sustains the view that th

etuses from the twenty-eighth week on were contributing sufficient insulin to combat the diabetic ymptoms in the mother, and it also gives evidence o show that their secretory powers became stimulated hen the percentage of sugar in the mother's blood as raised by the administration of sugar.

It is difficult to reconcile these conflicting results. here are, however, at least two points of difference etween our experiments and the observations of awrence. These are: (1) the dogs were completely epancreatised, whereas the patient was still in ossession of some islet tissue; and (2) the dogs were eceiving relatively much more insulin *plus* carbohydrate than the patient. In the light of what we now now regarding the variations which may occur in the ontrol of the internal secretion of insulin, it is quite ossible that the remaining healthy islets of the nother's pancreas were stimulated to secrete more much heavier than when she first came under observation. Both animals were decidedly fatter than the average. As has already been remarked, neither showed symptoms of any kind until within a short period of death. The results of the metabolic studies were exactly what was expected in the light of those obtained from the numerous other fattened diabetic animals which have been observed in the Toronto laboratories, and they stand out in sharp contrast with those obtained on lean animals which will be dealt with later.

The D : N ratio of dog 23 on the second day after removal of insulin stood at 6·01, and that of dog 32, on the third day, was 4·12. On the following days, in the case of both animals, respiratory observations were made during the forenoon; sugar was then given and the respiratory measurements continued during the afternoon. A small but decided rise occurred in the respiratory quotient, and a small but variable proportion of the sugar reappeared in the urine. The total ketone excretion in dog 32 was of about the same magnitude

TABLE IV.—*Dog No. 23.*

Date.	Weight. Kg.	O_2 consumption c.cm. per kg. hr.	CO_2 production c.cm. per kg. hr.	R.Q.	Urinary sugar output g. per 24 hrs.	Urinary nitrogen output g. per 24 hrs.	D : N ratio.	Total ketones in urine g. per 24 hrs.	—
an. 28.	11·4	—	—	—	47·15	8·31	5·67	Trace.	Last food and insulin 8.30 A.M.
, 29.	—	—	—	—	57·42	5·48	10·47	0·103	Catheterised 9 A.M.
, 30.	—	—	—	—	50·16	8·18	6·01	1·319	—
, 31.	10·0	591	Before sugar.	0·673	53·01	7·45	7·17	2·906	40 g. sucrose 12.40 P.M.
eb. 1.	9·7	629	After sugar.	0·706	28·03	8·59	3·27	2·687	—
, 2.	9·4	—	—	—	—	—	—	—	Died 10.45 P.M.
		613	Before sugar.	0·702				0·28 per kg. man 0·55	

Dog No. 23. (preg.).

an. 28.	13·4	—	—	—	85·00	8·42	10·20	Trace.	Last food and insulin 8.30 A.M.
, 29.	—	—	—	—	36·20	5·91	6·29	0·946	Catheterised 12·45 P.M.
, 30.	—	—	—	—	31·68	7·42	4·27	3·989	—
, 31.	12·0	—	—	—	27·00	6·55	4·12	5·491	—
eb. 1.	11·0	493	Before sugar.	0·697	53·80	6·44	8·34	5·080	40 g. sucrose, 12.55 P.M.
, 3.	—	618	After sugar.	0·714	—	—	—	—	Died 12 noon.
		—	—	—					

insulin, and that regeneration of new islets occurred s the pregnancy advanced. That this may have ccurred is at least suggested by the fact that for me time after delivery the diabetic symptoms of e mother were less severe than they had been uring the earlier weeks of the pregnancy. But they timately returned, which would seem to indicate at a temporary improvement in the secretory nction of the maternal pancreas was responsible r the amelioration. On the other hand, evidence pporting the view that the fœtal insulin had nefited the mother in Lawrence's case is found the fact that the blood-sugar at the time of delivery as much lower in the fœtal than in the maternal ood. The second difference may explain why we ere unable to demonstrate any fœtal contribution insulin, for it is well known that when insulin is latively in excess of the carbohydrate turnover the ldition of each extra unit has a much lesser effect an otherwise.

OURSE OF DIABETES ON WITHDRAWING INSULIN FROM TREATED ANIMALS.

The observations were undertaken by Dr. Soskin, nd the results of the urinary and respiratory analyses e given in Table IV.

It will be observed that dog 23 was somewhat ghter than she had been a few months earlier—1·4 kg. as compared with 14·1 kg.—but that dog 32 ad practically maintained her weight and was per kilogramme body-weight as the largest reported in man (0·45 g. per kg. for man), and it was not demonstrably affected by the ingestion of sugar, although this probably was responsible for the ketone excretion not rising to higher levels than it did. Unfortunately, the blood was not examined.

At post-mortem examination it was found that pancreatectomy had been complete in both animals. The duodenal wall adjacent to the bile and pancreatic ducts was examined microscopically by Drs. D. J. Bowie and W. L. Robinson. No pancreatic tissue could be detected in the case of No. 23, but a small piece embedded in the submucosa was found near the stub of the chief pancreatic duct in No. 32. This measured 2 mm. by 3 mm., and

TABLE V.

	Sample.	Dog 23. Per cent.	Dog 32. Per cent.
Muscle glycogen .	1.	0·111	0·16
	2.	0·173	0·15
Liver glycogen ..	1.	0·029	0·052
	2.	0·049	0·061
Liver fat ..	1.	44·31	41·9
	2.	44·24	41·9

apparently had no duct connexion with the intestine. Only a few of the cells composing it contained violet-staining granules, probably zymogen. A most careful search, in which the special staining methods previously described by Bowie were used,[10] failed to reveal any islets. It may be remarked that this was to be expected, in view of our experience with numerous similar pancreatic nodules in other animals (cf. Bowie [11]). There was much subcutaneous and mesenteric fat, especially in No. 32. All the organs appeared to be healthy on naked-eye examination, but the liver was large and pale. Microscopic examination did not reveal anything of note, except that the liver cells were very large and vacuolated, and the circular muscle-fibres of

the aorta were swollen and shreddy in appearance. In the latter also, areas were noted in which gelatinous changes, leaving open spaces, had occurred. There was no hardening of the arteries. Chemical analysis was made of the muscles for glycogen and of the liver for glycogen and fat.

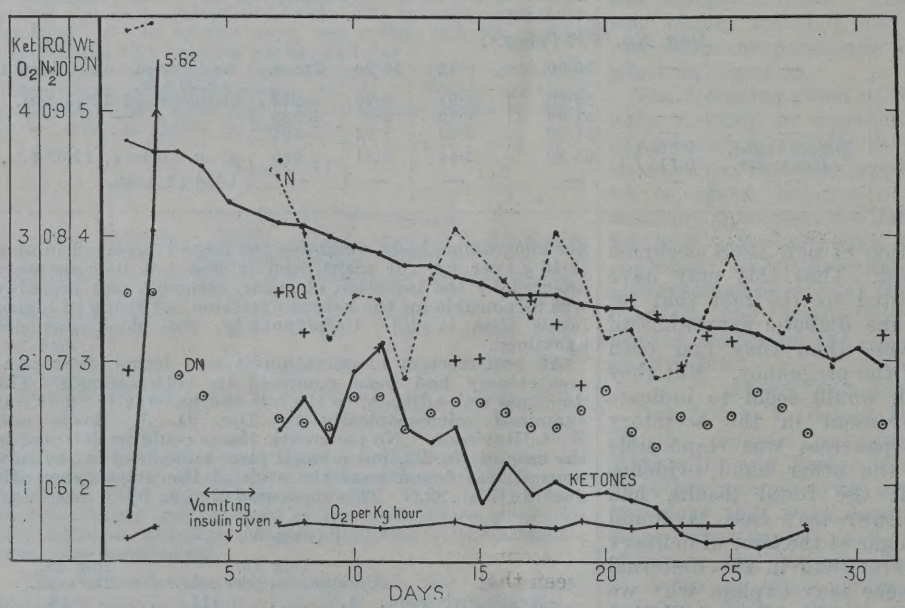
The results were as given in Table V. The very low glycogen and the high fat content of the liver are noteworthy.

When we bear in mind that the normal span of life of a dog is 12–15 years and that of a man 60–70, we may assume that the four years during which both these completely depancreatised animals lived would correspond to 20 years in the case of man, and undoubtedly, had the insulin treatment not been discontinued, the dogs would have survived much longer. None of the symptoms of cataract, of gangrene, of arterio-sclerosis or of nephritis, which some have supposed may supervene after the blood-sugar has been supernormal for some time, was manifested by either animal.

The Course of Pancreatic Diabetes when Food but No Insulin is Given.

In view of the great accession to our knowledge of diabetes which resulted from von Mehring's and Minkowski's discovery that this disease follows experimental removal of the pancreas, it is surprising that the number of complete records of the condition is not large. The literature is surfeited with accounts of the symptoms and the clinical history of diabetes mellitus in man, but, although these accounts have given useful guidance in its diagnosis and dietetic treatment, they have not taught us as much as have

FIG. 1.



Curves showing the behaviour of body-weight, excretion of nitrogen and ketone bodies, respiratory quotient, D:N ratio, and the oxygen consumption in a depancreatised animal during a period of a month after removal of insulin. The values for the various curves are indicated in the columns along the ordinates. Time in days is given on the abscissa. + = R.Q. ⊙ = D:N ratio.

the experimental investigations concerning either the fundamental cause of the disease or its rational treatment. The reason for this is probably because the most severe cases in man are never completely diabetic (cf. Joslin,[12]) there being always some more or less undamaged islet tissue left in the pancreas. Not only will the insulin which this secretes prevent diabetes from developing to its full intensity but—and this is more serious from the scientific point of view—the secretion will not be constant from day to day. These variations in the internal secretion of insulin have been responsible for many errors of judgment regarding the efficacy of this or that therapeutic measure in treating the disease. From time to time, for example, various substances have been advocated as antidiabetic remedies because they brought about some diminution in the glycosuria or seemed to effect a temporary improvement in the clinical condition. In some countries local plants have for long had a reputation as remedies, more especially those of the myrtle family. But so long as some islet cells remain functional it is most likely that any beneficial action which such substances may temporarily display is due to their stimulating influence on the secretion of insulin, and it is evident if this be the case, that their prolonged administration must be detrimental, since over-stimulation of the already weakened islets will lead to exhaustion and further decay. On several occasions I have had sent to me various of these reputed remedies with such assurances of their efficacy from the clinical standpoint that I have investigated their action on depancreatised dogs, the invariable result being that they had no effect on the diabetic symptoms. They did not alter the symptoms in complete diabetes although they may have temporarily alleviated them in the incomplete form of the disease as met in man.

In view of these facts it is clear, I think, that experimental pancreatic diabetes must be regarded as the final court of appeal in giving a decision as to whether any drug or other remedial measure should be used in the treatment of diabetes in man. As I would further insist that the reputed remedy must be capable not only of removing the symptoms of the disease but also, by its repeated administration, of maintaining the animal in normal condition, as we have seen insulin can do. Since, therefore, the depancreatised animal is indispensable in the investigation of the problems of diabetes, it is important that we know precisely for how long it may live and the behaviour of the symptoms when no remedial measures are taken. Dr. Soskin[13] has just completed an investigation along these lines in Toronto, and, with his permission, I will refer to some of the most important facts which he has brought to light.

After depancreatisation, the animals were treated with insulin for some weeks before the observations were started. They were all apparently in good condition when the insulin was withdrawn, and none of them was excessively fat. As we have seen, fatter animals never survive for more than five or six days after removal of insulin, so that they would have been unsuitable for one of Dr. Soskin's main purposes, which was to see for how long a depancreatised animal can remain alive without insulin, but with every other care. In all cases food (meat, gelat-

and casein) and water were allowed throughout the observation, although several of the animals refused to take the former. The urine was collected daily and the amounts of glucose, nitrogen and ketone bodies in it were determined. On certain days also the animals were placed, usually for periods of two or three hours each, in a respiratory apparatus of the Benedict type. I have described this apparatus elsewhere,[13a] and need only remark here that its accuracy was proved periodically by burning measured amounts of alcohol in it.

The observation, of which the results are shown in the curves of Fig. 1, is the most complete we have on record. The animal took food (300 g. lean meat, containing therefore 60 g. protein and 30 g. fat) throughout, and excreted several grammes of nitrogen less than was contained in the food, owing, no doubt, to imperfect digestion and absorption in the absence of a secretion of pancreatic juice. The very considerable variability in the nitrogen excretion is probably also to be related to the faulty digestion. The D : N ratios after the first week averaged about 2·6, but varied somewhat from day to day, and it is interesting to note that they ran more or less parallel with the nitrogen excretion, a relationship which was also noted in other animals of the series. This would seem to indicate that increased protein metabolism was accompanied by the excretion of a greater proportion of the sugar derived from this source. The ketonuria started on the first day of the diabetes and became very high on the third and fourth when, indeed, vomiting, which in dogs is the first general symptom of coma, became so acute that insulin had to be administered in order to save the animal. After this the ketonuria gradually declined and although, no doubt, the administration of insulin was responsible for the inception of the recovery, it is significant that in other depancreatised animals not so treated the ketonuria usually attained a maximum about the fifth day, and then gradually declined without insulin. This stands out in sharp contrast with the course of the ketosis in fattened animals, which do not survive the coma unless treated immediately upon the appearance of its first symptoms. In only one case in the series, the results of which are given in the curves of Fig. 2, did severe ketonuria develop at a later stage. The respiratory quotient in the animal of Fig. 1 varied between 0·680 and 0·727, the higher quotients being caused by an increase in carbon dioxide expired rather than by a decrease in oxygen retained in the body. No relationship can be traced between variations in the quotient and the glycosuria or ketonuria.

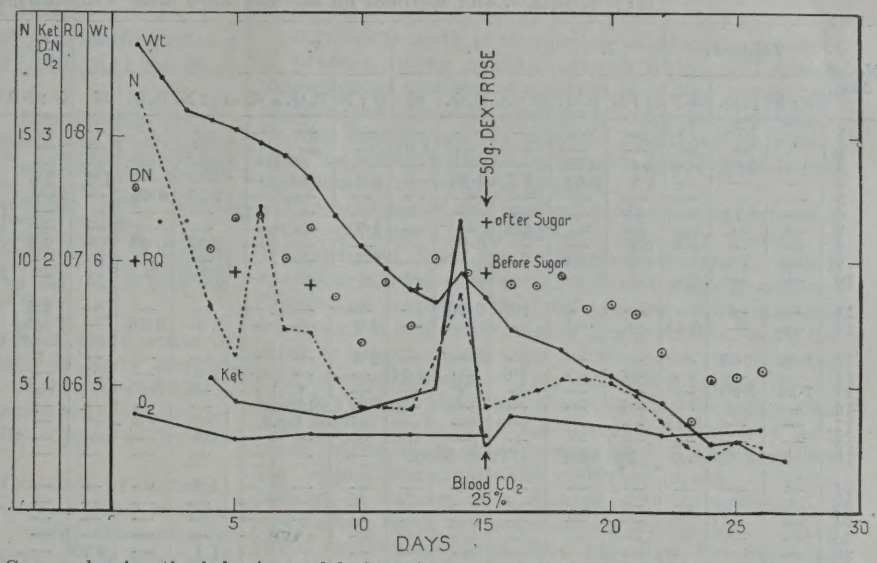
The second of the charts (Fig. 2) shows the course of the diabetic symptoms in an animal which did not regularly take its food. Towards the end of the second week of the observation, the ketonuria, which had previously been moderate, became very marked, and was accompanied by a great increase in the excretion of nitrogen and a fall in the percentage of carbon dioxide in the blood. Curiously enough, also, the body-weight at this stage increased for a day or so, but the notes do not indicate to what this was due. After the fifteenth day, on which sugar was given, the body-weight, the nitrogen excretion, and the D : N ratios all fell steadily until the twenty-sixth day, when the ratio was 1·14. The ketonuria and the carbon dioxide content of the blood remained steady.

The Significance of the D : N Ratio and the Respiratory Quotient in Diabetes.

Tables VI. and VII. are compiled from Dr. Soskin's protocols, and they show the most significant results obtained with regard to the D : N ratio, the respiratory quotient, the ketone body excretion, and the proportion of sugar recovered in the urine after sugar ingestion.

It is seen that after the third day of the diabetes the D : N ratios were usually at or slightly above

FIG. 2.



Curves showing the behaviour of body-weight, excretion of nitrogen and ketone bodies, respiratory quotient, D : N ratio and the oxygen consumption in a depancreatised animal during the period of a month after the removal of insulin. The values for the various curves are indicated in the columns along the ordinates. Time in days is given on the abscissa. + = R.Q. ⊙ = D : N ratio.

2·5 in four of the animals, including those of which the results are shown in the curves. In the remaining six animals the ratio was never over 2, and it varied considerably. Since there can be no doubt that extirpation of the pancreas was complete in every case, these results show the fallacy of taking the D : N ratio as a criterion of the intensity of the diabetes, as Markowitz and I pointed out several years ago.[14]

The behaviour of the respiratory quotient was also contrary to common belief. In phlorhidzin poisoning, as also in human diabetes, the quotient is between 0·660 and 0·707 when allowance is made for the protein metabolised. During the past few years it has been frequently measured in depancreatised dogs in the laboratory at Toronto, and has also been found at correspondingly low levels, at least during the week or so after removal of insulin, and we were greatly surprised when L. Hédon published results showing that much higher quotients may occur at later stages of the diabetes.[15] It was, indeed, partly to satisfy ourselves that this is really the case that the present observations were undertaken, and it can be seen that high quotients were observed in three of the nine animals in which respiratory observations were made. Confirming Hédon, it was found that the high quotients occurred at a late stage of the diabetes, and since an increase in carbon dioxide excretion rather than a decrease in oxygen-uptake was responsible for them, the question arose whether they might depend on a state of acidosis. Dr. Soskin therefore determined the alkali reserve of the blood (Van Slyke method) in many of the animals, but without finding that this bore any relationship to the high quotients. It is true that he sometimes found very low values for carbon dioxide—25·5 volumes per cent. in one case—but there was no apparent parallelism between this and the respiratory quotient. Hédon

suggests that, since the high quotients are most usually seen after the diabetes has existed for some time, they may be due to a loss of power by the liver to convert protein and fat into carbohydrate, a process which, by absorbing oxygen, would keep the quotient at a low level. He believes that combustion of what carbohydrate remains in the body is responsible for the higher quotient, but it is difficult to see how the energy thus derived could maintain the animal in life for more than a few hours.

TABLE VI.—DEPANCREATISED DOGS (SOSKIN'S OBSERVATIONS).
D:N's, R.Q.'s, and Ketones on selected days after withdrawing insulin.

No. of day.	Table 1.			2.		4.			5.			6.			7.	8.		9.		10.	
	D : N	R.Q.	K	D : N	R.Q.	D : N	R.Q.	K	D : N	R.Q.	K	D : N	R.Q.	K	D : N	D : N	R.Q.	D : N	R.Q.	D : N	R.Q.
1	—	0·75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	1·01	—	—	—	—	—	—	—	—	—	—	—	—	—
3	—	0·69	—	3·4	0·68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	—	—	—	2·5	0·68	2·3	0·73	—	3·3	0·70	—	—	—	1·1	2·3	—	—	—	—	—	—
5	—	—	—	—	—	—	—	—	—	—	—	2·35	0·69	—	—	—	0·75	3·3	0·69	2·5	—
6	—	0·71	—	—	—	—	—	—	—	—	1·35	—	—	—	—	1·9	—	—	—	—	—
7	—	—	—	—	—	2·3	—	—	2·9	—	—	—	—	—	—	1·6	—	—	—	—	—
8	—	—	—	1·8	—	—	0·71	—	—	—	—	2·30	0·68	—	2·8	—	—	—	—	—	—
9	—	—	—	1·5	0·68	—	—	—	—	—	—	—	—	—	—	—	0·92	1·4	0·67	—	—
10	—	—	—	†	—	—	—	—	—	—	—	—	—	—	—	Took some food.		—	—	—	—
11	—	—	—	—	—	1·3	0·80	—	—	—	—	—	—	—	2·5	—	—	—	—	—	—
12	—	—	0·39	—	—	—	—	—	2·9	—	—	1·5	0·68	—	Took food.	†	—	2·4	0·69	—	—
13	1·98	0·83	—	—	—	—	—	—	2·3	—	—	—	—	—	†	(Infection).		—	—	—	—
14	—	—	—	—	—	1·6	—	0·14	—	—	0·56	1·9	—	2·3	—	—	—	—	—	—	—
15	1·30	0·90	—	—	—	—	†	—	—	†	—	—	0·69	—	—	—	—	—	—	—	—
16	—	—	—	—	—	—	—	—	Accident.			—	—	—	—	—	—	—	—	—	—
17	—	—	0·18	—	—	—	—	—	Took food.			—	—	—	—	—	—	—	0·70	—	0·68
18	—	—	—	—	—	—	—	—	—	—	—	1·9	—	—	—	—	—	—	—	—	—
19	Took food.			Refused food.		Took food.			—	—	—	—	—	—	—	—	—	2·5	0·69	—	—
21	—	—	—	—	—	—	—	—	—	—	—	1·6	—	—	—	—	—	—	—	—	—
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·71	—	—
24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1·6	—	—	—
25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Took food.		—	—
26	—	—	—	—	—	—	—	—	—	—	—	1·1	—	0·70	—	—	—	—	—	—	—
30	—	—	—	—	—	—	—	—	—	—	—	Took some food.			—	—	—	—	—	—	0·70
31	—	—	—	—	—	—	—	—	—	—	—	—	†	—	—	—	—	—	—	2·2	—
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·69
34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1·9	—
37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1·6	0·75
																				Took food.	

† Indicates that the animal died.

RECOVERY OF INGESTED SUGAR.

Perhaps the most interesting of the results were those relating to the extent to which administered glucose reappeared in the urine, and its effect on the respiratory quotient and the excretion of nitrogen. In every instance the ingestion of glucose caused an increase in respiratory quotient, and a decrease in the excretion of nitrogen (Table VII). The results confirm those of Wierzuckowski [16] (see also Deuel, Wilson, and Milhorat [17]), who also observed in phlorhidzin-poisoned dogs that the rise in respiratory quotient was particularly well marked when the glucose was given in two portions, one an hour o so after the other, a procedure which was followe in many of the present experiments.

TABLE VII.—EFFECT OF SUGAR ON DEPANCREATISED DOGS.

No.	Day	Glucose administered.	R.Q. Preceding Administration.	R.Q. After Administration.	Nitrogen. Preceding.	Nitrogen. After.	Glucose recovered.*	Glucose used (per cent.).
		g.					g.	
4	8	50	0·707	0·735	17·5	13·1	40	20
	15	50	—	0·805	15·02	13·2	26	48
5	7	50	0·696†	0·759	—	—	—	—
	11	50	—	0·765	12·75	9·09	21·7	56·6
6	15	50	0·691	0·732	8·54	4·23	43·0	14·0
7	12	25+25‡	—	—	10·82	4·66	32·5	35·0
9	9	50+50	0·668	0·709	22·93	23·96	55·3	44·7
	12	50+50	0·690	0·722	26·58	23·73	82·6	17·4
	19	50+50	0·687	0·750	25·15	22·58	87·8	12·2
	23	50+50	0·714	0·813	20·95	16·32	36·35	63·6
10	33	25+25	0·691	0·771	10·44	11·01	19·23	61·6
	37	25+25§	0·754	0·853	—	—	—	—

* Calculated by usual method allowing for fall in nitrogen.
† Taken several days previously. ‡ Died on 13th day. § Died on 38th day.

Much of the ingested sugar reappeared in the urine and a rough general parallelism can be seen betwee the proportion which reappeared and the extent o the rise in respiratory quotient. Although calculation in metabolism are treacherous unless all the data hav been observed over long periods of time, it is never theless often useful to attempt them with the shorte period data, on the assumption that the latte correspond to what the former would have been On this basis we may calculate from the amoun of sugar utilised the extent to which the quotien would be expected to rise.

Thus on the twenty-third day of Experiment IX., whe the most marked rise in respiratory quotient occurred, th oxygen consumption per kg. body-weight and per hou before sugar was 723 c.cm., or 128·4 litres in 24 hours, an the quotient, 0·714 (cf. Soskin's tables [13]). According t the Zunz-Lusk tables, this means that the total hea production was 603·5 calories, and that 3 per cent. of carbo hydrate was used to produce it, equalling 18 calories, o 4·3 g., of carbohydrate. After sugar the quotient rose t 0·813, which means that 36 per cent. of the energy came fro carbohydrate and, assuming that this level was maintained then, during a period of eight hours, 43·2 litres of oxyge were used, or $43·2 \times 4·82 = 208$ calories, or 50·8 o carbohydrate. The excess consumed, according to th respiratory analysis, was, therefore, somewhere about 47 g. whereas actually 63·6 g. of glucose disappeared.

The most important result of the research is tha both the respiratory quotient and the sugar balanc show definitely that the completely diabetic anima is capable of oxidising large amounts of carbo hydrate and, this being so, it is not surprising that th excretion of nitrogen should fall decidedly. Thu one more nail is put in the coffin of the long moribun

d now quite dead theory that diabetes is due to a
s of power by the tissues to oxidise carbohydrate.
is power may be depressed, as I have elsewhere
inted out,[21] but this depression is probably
ondary to other disturbances of metabolism.

mparison of Diabetes in Fat and Lean Depancreatised Dogs.

The differences in the course of pancreatic diabetes
lean and fattened dogs are very striking; the most
portant are as follows:

Fat animals.	*Lean animals.*
Death usually occurs about fifth day, preceded by mptoms of vomiting, coma, anhydræmia.	Animals may live for over a month. Vomiting may appear about fifth day, but animals usually recover.
After coma appears, treatnt with insulin sometimes s to prevent death.	Symptoms very readily removed by insulin.
Hyperglycæmia very marked.	Hyperglycæmia moderate.
Ketonæmia marked.	Ketonæmia not so marked.
D : N ratio after third day ally above 3·65.	D : N ratio much lower and may be well below 2 by the second week.

The diabetes is in every regard far more acute in
fattened animal, and the relatively more marked
perglycæmia as well as the higher D : N ratios
ongly suggest that fat must be a source of some of
sugar. This hypothesis is also supported by the
owing observations:

. The D : N ratio on the fifth day in fattened
ancreatised dogs often exceeds 5 : 1 after making
wance for the glucose which might theoretically
derived from the glycogen stores of the liver and
scles (cf. Chaikoff [18]).

. Repeated injection of epinephrin may cause
siderably more extra glucose to be excreted than
be accounted for after making allowance for that
ivable from glycogen and protein (Chaikoff and
ber [19]).

. Excessive ingestion of fat may cause an excretion
extra glucose which exceeds that derivable from
ogen and protein (Soskin [20]).

have discussed elsewhere the further evidence
ch indicates that gluconeogenesis is not restricted
rotein (Macleod [21] and Macleod and Gottschalk [22]),
will only add here that the two criteria upon
ch the denial of this hypothesis rests—namely,
constancy of the D : N ratio and of the respiratory
tient in completely diabetic animals are definitely
wn by our researches to be unsound. These
os are undoubtedly constant under strictly
dardised conditions in animals poisoned by
rhidzin, but this is not true diabetes, since insulin
ill available in the body of the animal. Finally,
hould be pointed out that the conclusion that fat
form sugar in the animal body is also supported
umerous clinical observations on diabetes mellitus,
ch have been admirably summed up by
muyden.[23]

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(*Continued at foot of next column.*)

THE MEDICAL TREATMENT OF CANCER.*

By A. T. Todd, M.B. Edin., M.R.C.P. Lond.,
HON. ASSISTANT PHYSICIAN TO THE BRISTOL ROYAL INFIRMARY.

Although there is no medical treatment of cancer at present, or no medical system which will ensure regression of malignant growths in a high percentage of cases, the title of this lecture was chosen deliberately. It was hoped that the surgeon might be impressed from the outset with the fact that medical or medicinal treatment may really be of value.

The attitude of the medical profession to cancer is rather peculiar; it is, perhaps, the only disease, as differentiated from malformation or injury, which has been handed over to the surgeon without reserve. Physicians explain this by saying that medical treatment is ineffective, and is likely to be so until the cause is known, when some vaccine or serum therapy may become possible. This attitude is rather deplorable, for though the cause of cancer may be discovered, it is quite likely that the discovery may not help much more than the discovery of Koch's bacillus has helped the treatment of tuberculosis. A comparison of cancer as a disease with tuberculosis is justifiable; there are some strong similarities. Sixty years ago tuberculosis was regarded by some as probably neoplastic, and there were almost as many theories as to its cause and so-called types as there are for cancer now. We know the cause of tuberculosis now, and can reproduce the disease; but most of us have stopped trying to treat the disease; we treat the patient instead, to his benefit. Cancer may turn out to be similar; we have been treating the disease as intensively as possible, and the results are well known. May it not be well to follow the programme of other chronic diseases, and try treating the patient? May he not have the disease because of some metabolic or other abnormality of which the relationship is obscure at present?

Lead Selenide.

This research was commenced in 1925, shortly after the revival, or rehabilitation, of the lead treatment of cancer was brought about at Liverpool. Lead is an old remedy for cancer; Ambroise Paré used it with success, and we (the plural used to include the team) have obtained some results from a modification of his method.[1] As there had been signs of promise from selenium in cancer, it was considered that the union of lead with selenium might give better results than lead alone. A colloidal lead selenide was made and, after careful testing on

* A lecture and demonstration of cases delivered to the British Association of Surgeons at Bristol, on May 2nd, 1930.

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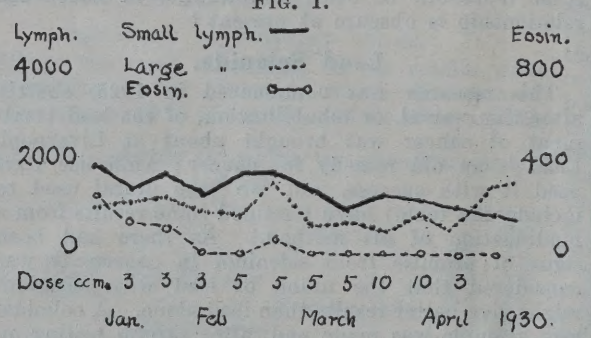
animals, used for man. Fortune was kind to us, for our first few cases happened to be more than usually susceptible to this treatment; thus we were encouraged to continue.

A new method is often successful at the start. Trousseau said: "Let us make haste to use this remedy while yet it cures." In order not to be misled, we made the test as difficult as we could; we accepted for treatment only advanced and completely inoperable cases. The only choice of cases was certification that nothing could be done, and that the patient was not actually moribund. A leader in experimental medicine said, when this programme was outlined to him, that if we were successful in 1 per cent. of cases we would have done much; we can definitely show more than that. But if I am asked for exact percentages and statistics I am unable to give them. It is impossible to give percentages on about 100 cases, for though we have treated more than this, for various reasons, only about 100 are worthy of scrutiny. Moreover, how shall we warp statistics to show relief of pain, prolongation of life and, more important—the gratification of the patient given hope and action instead of a passive expectancy of death?

We do not expect to cure the cases we have chosen to treat. The late advanced case, riddled with metastases and often with involvement of vital structures is not the type of case on which to base encouraging statistics. Even though the cancer were removed, the cicatrisation of repair would probably kill more quickly than the cancer. We chose these cases to demonstrate the utility, or otherwise, of this treatment in producing relief of pain, euphoria of the patient and regression of the cancer; then, when a technique was learned, we should hope to apply the method to earlier cases, with less widely spread growth, and therefore some hope of survival. There are several valuable monetary prizes for the discoverer of a cure for cancer, but it is

FIG. 1.



Leucocyte count, absolute, of non-reactive case. Alteration of the dose did not affect the leucocytes.

probable that these prizes will never be awarded; though the cancer may be got rid of, the patient dies. We have records of a tolerable number of cases of widely spread cancer treated by this method in which at autopsy little or no growth was found. Until diagnostic methods have improved to the degree at which late cancer is a rarity, there is no point in attempting more; for, though a remedy more active than ours is found, it could not be accepted as a cure, for these late cases would die the quicker from its use.

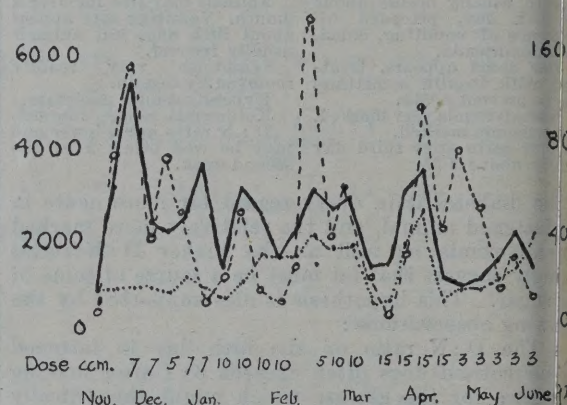
To give a brief example; a patient with a large, bleeding, sarcoma of the lower dorsal spine was one of the first treated. We gave a large first dose, and were gratified to see the bleeding stop and the mass shrink. About a week later we doubled the dose, and the visible mass became gangrenous. As it extended into the peritoneum, the patient died; at the autopsy only one or two small masses had escaped gangr —i.e., the remedy was excellent, but the patient died of

Throughout this research our programme has be to develop a technique with the hopeless cases, th apply the method as an addition to the pres surgical and radiological treatments.

THE PREPARATION USED.

As the technique of the treatment has been pu lished,[2] only a brief summary need be given he The preparation we use is available to all, bein

FIG. 2.



Leucocyte count of reactive case. The lines and figures have same significance as in Fig. 1.

0·4 per cent. sol of lead selenide, manufactured by British Drug Houses, Ltd. It is labelled D4S, and no profit from the sale of colloid or of the monograph is made by any member of this research team. No patient, though some have been wealthy, has been allowed to pay any fee for treatment. I have been asked why one firm is allowed a monopoly; the reason is that we were able to teach one firm the very exact method necessary to produce a non-toxic colloid; we could not hope to publish a description accurate enough for any chemical manufacturer to use.

The colloid is of low toxicity when made in the proper manner; a rabbit will tolerate 4 c.cm. per kilogramme. It is not possible to state the lethal dose for an adult human, but as much as 33 c.cm. has been given in one dose without adverse effects. The toxicity does not appear to depend upon the colloid directly; adverse effects, such as temporary increase of pain around the neoplasm and pain at the sacrum appear to be proportional to the amount of action on the neoplasm. These reactive effects are considered to be due to protein poisoning from breakdown of cancer tissue. Symptoms of toxic action of lead are unusual, colic is seldom observed. Immediate shock-like reactions are seen occasionally; they are similar to the crises observed after injection of preparations of any of the heavy metals. These immediate crises are readily prevented by administration of ephedrine hydrochloride and adrenalin just before the injection.

DOSAGE.

The size of the initial dose depends upon the nature of the neoplasm. From our experience we divide neoplasms into two classes:—

1. Likely to be *resistant:* squamous carcinoma of tongue, vulva, skin generally; adenocarcinoma of breast; carcinoma of cervix; carcinoma of rectum. For these an initial dose of 5 c.cm. is given.

2. Likely to be *sensitive:* any neoplasm which has recently been radiated with gamma rays; sarcoma; endothelioma; carcinoma of ovary; hypernephroma;

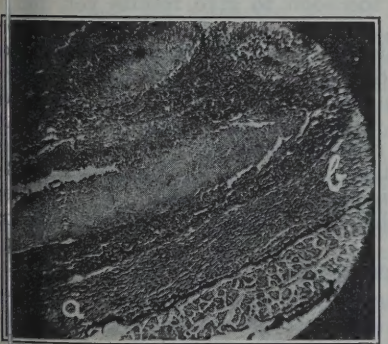
imary or secondary carcinoma of liver or kidney. For ese an initial dose of 1 c.cm. is given.

We give the colloid intravenously at weekly intervals. The size of the later injections depends upon ie amount of focal and general reaction, for this, s was said above, appears to be proportionate to ie amount of action on the neoplasm. A definite, ppreciable reaction is desired, it should last for about 4 hours and comes on from 6 to 48 hours after the njection; the time of onset of reaction varies from atient to patient, but is fairly constant for a single atient. When the reaction has passed there is sually a feeling of well-being with increase of appetite nd diminution of pain; some of the patients describe as a tonic action. We increase the size of the jection by 1 or 2 c.cm. in sensitive neoplasms, and to 4 c.cm. in non-sensitive neoplasms, until we find e maximum dose which is followed by a satisfactory inical and hæmatological reaction; that dose is then aintained. We claim that the treatment has a vourable action in the majority of the cases; it is timated that in about one-fifth of the patients there no appreciable result, but in the remainder more or ss improvement is found to follow.† If the treatent is given haphazard and in large injections there ll be only unfavourable results. We tried maximal ses for a time, that is, we gave the patients as much they would stand; the result appeared to be an crease in the rate of growth of the cancer. Too nall doses might have the same effect. We claim at the treatment is good, but the explanation of action is not yet proved.

THE REMEDIAL EFFECT.

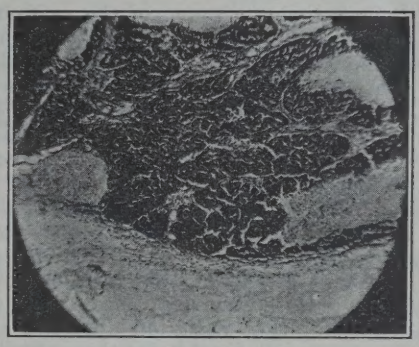
As with all new remedies a specific, or immediate, tion on the cancer cell was considered to be the planation. The Liverpool school pointed out certain resemblances in the cells of certain neoplasms to certain cells of the decidua, and correlated the known abortifacient action of lead on the decidua with this. They considered that the preparation of lead which they used was taken up by the cancer cell and the ested lead occasioned the death of the cell. This ory was not accepted in Bristol, for we found that more of this supposed cancer cell poison we gave, quicker was the growth of the cancer; then ue analyses always showed that there was less tal lead in the cancer than was found in the normal ues. Since every so-called specific remedy is nd later to have an indirect action, we considered t lead selenide would also act indirectly. Examination of the blood, originally undertaken to guard against anæmia and other toxic manifestations, showed that there was a definite sequence of changes after injection. In the cases which showed response we found that the small lymphocytes and eosinophil leucocytes of the blood showed an increase; while in cases which did not respond this blood change was not observed (Figs. 1 and 2). In addition, we found that the normal fat-splitting enzyme of the blood, which was usually increased in late cancer, showed a diminution when the treatment was being effective.

FIG. 3.



ort adenocarcinoma. Junction tissue appears as a well-marked belt **a—b**. The same amount of metal lead (but as guaiacolate, not selenide) and radium as in Fig. 4. Necrosis of the superjacent cancer is almost complete.

FIG. 4.



Twort adenocarcinoma. Absence of junction tissue, presumably from gamma radiation after selenide. Necrosis of cancer is trivial. Cf. Fig. 3.

It would take a long time to go into the many possibilities and give explanations as to what these cell changes might signify; to condense, it is considered that lead selenide is a stimulus to the defence which is put up against the irritation or invasion of a malignant neoplasm. The cellular defence, if it exists, is familiar to the pathologist as a more or less imperfect barrier of lymphoid and plasma cells, fibroblasts, eosinophil and basophil cells, and that endothelial cell which has many names, but is best called the macrophage. In slowly growing cancers this surrounding, or junction tissue, is abundant, and it is conceivable that it is a barrier; in rapidly growing cancer the junction tissue is scanty, and perhaps this is the reason for the rapidity of growth. On the other hand, it can be argued that the poverty in junction tissue in rapidly growing neoplasms is due to the lack of time for junction tissue to develop.

We have fairly definite evidence that this treatment increases the lymphocytes, plasma cells and eosinophil leucocyte of the blood. We know that any electro-negative colloid, of which D48 is one, will tend to increase the activity of the macrophages. We find that hyperplasia of fibrous tissue frequently follows to an embarrassing degree, for in cases of extensive cancerisation of the peritoneum, this fibrous hyperplasia often kills the patient from stenosis of ureter or intestine. Though we do not say that the cells of the junction tissue are derived from the cells of the blood stream, and that increase of lymphoid cells in the blood will be followed by an increase round the neoplasms, yet the stimulus which causes increase in the one place might be expected to cause an increase in the other.

Chemotherapy plus Irradiation.

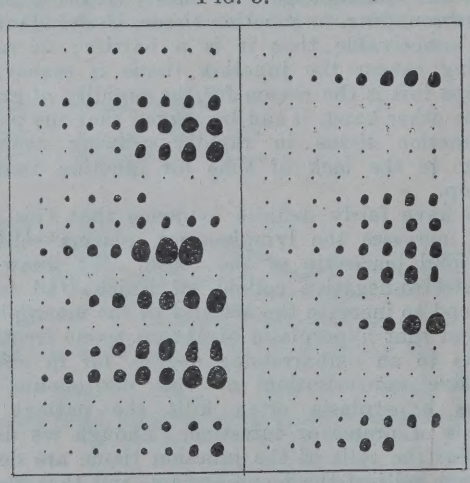
This conception of our treatment, being a stimulus to the defensive action of the junction tissue in addition to any possible stimulation of general defence mechanisms, is of importance with regard to combination of such chemotherapeutic agents and radiotherapy. We find that radium treatment of implanted mouse cancer, the Twort adenocarcinoma, appears to cause an increase of this junction tissue, and we are inclined

†This estimate is made from the whole of this series; if id comprised mainly carcinoma of lip and tongue, or other tant types, more than one-fifth would be found nononsive.

to think that the regressing action of gamma rays in vivo is due to stimulation of this junction tissue, rather than to direct noxious action on the cancer cell. The plates show that where junction tissue is plentiful and well formed the proximal cancer cells are necrosed, wholly or in part. Where junction tissue is scanty or absent the cancer shows no necrosis, even though the dosage of radium was kept constant (Figs. 3 and 4). Since, then, radiation and some lead compounds both increase this mesoblastic defence tissue, a union of the two ought to be more potent than either singly. Though proof of this opinion is not complete, we have evidence supporting it in man and in animals, and I have verbal accounts of some encouraging results from other centres.

Our early efforts to combine radiation with lead selenide were unfortunate. A record has been published,[3] and full details are not necessary here. In brief, we found that the application of half carcinoma doses of radium, radon, or X rays shortly after treatment with lead selenide was followed by a prompt increase of the rate of growth of the neoplasm; this was one reason for considering the possibility that radiation does not act primarily on the cancer cell, for if it did there should not have been increased growth. We know that there is a stimulating dose for cancer, but this is regarded as considerably less than half the accepted dose. When 12 cases had been radiated after injection of lead selenide, and the stimulation was observed in each case, we stopped this in man and continued the research on animals. We found that the result was the same in implanted cancer; radium applied in usual dosage soon after selenide injection resulted in larger growths and more rapid death than was found in the untreated control animals. We have reason to believe that it is the selenium which is responsible

FIG. 5.

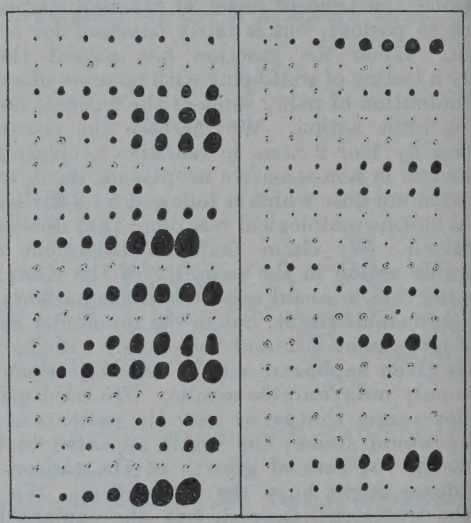


Twort adenocarcinoma treated by oral administration of pure vitamin A. Controls left; treated animals right. Each horizontal line is composed of the silhouette of the cancer at weekly intervals. The size is reduced about ten times.

for this, for a colloidal lead guaiacolate could be administered before irradiation without this adverse result. Fig. 3 showing well-formed junction tissue and necrosed cancer is from a mouse treated with lead guaiacolate and then radiated. Fig. 4 showing the reverse is from a mouse receiving lead selenide and then radium; both sets were given exactly the same amount of lead metal and radium. The explanation appears to be as follows:

The members of the selenium group of metalloids are peculiar inasmuch as they are ionised by deep X and by gamma rays. We have proof for sulphur, which is nearly related to selenium that laws for the one will h for the other, that diminution of the size of the particle followed by increase of toxicity; this would follow, t smaller the particles the larger would be the surface availa for chemical action. We picture the selenide taken by the macrophages and possibly the fibroblasts around cancer in the junction tissue; here the colloid is sometim visible as relatively large clumps in the cytoplasm. Wh

FIG. 6.



Twort adenocarcinoma treated by oral administration of vitamin D. Controls left, treated animals right, as in Fig.

gamma rays reach it some or all of this mass is ionised, toxicity is increased, and the cell containing it is destro When a non-ionisable colloid, such as the guaiacolate is used this cell destruction does not follow.

We, and others, are attempting to work ou technique for radiation therapy concurrently wh selenide. It is too soon to give results yet, but this laboratory, and at least one other, there h been results which give promise of this combinat being useful. Such a combination would req less radiation and less selenide. For the present are careful not to subject to radiation any pati who has been recently treated with selenide. ask for any radiation to be given first, in the h that this will increase the junction tissue and function, and that the selenide will cause a furt increase.

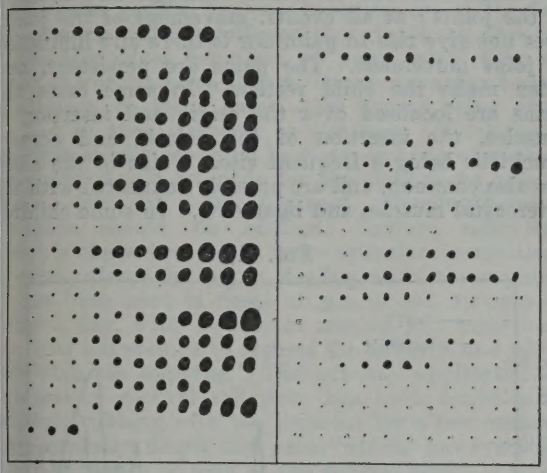
Additional Treatment.

The remaining part of the treatment we use n not detain us so long, but its importance is not the for this. In view of the known fact that lead te to be stored in the bones as a compound lead-calc phosphate, we considered that the patients ought to be treated with any substance likely to dimi this storage; otherwise any condition associated v acidosis would occasion a liberation of unkn amounts of ionic lead from the skeleton and cause poisoning. The obvious remedy was calcium chlor for this would not only cause enough acid shift in plasma to prevent much bony deposit of lead, bu would also give the organism a sufficient depô calcium for any depletion of the skeleton.

In addition, we know that cancer tissue and the pla of cancer patients show a poverty of calcium. The pov of calcium is proportional to the rapidity of growth o cancer; the more virulent and advanced the growth less is the calcium content of cancer and plasma; perio sarcoma appears to be an exception. Moreover, researches on the acid-base equilibrium of cancer pat and animals show that in precancerous states and in ca before cachexia has developed, the patient is alkalot

kalosis is accompanied by a diminution of ionised, or tive, calcium. Calcium chloride, though a neutral salt, uses acidosis by relinquishing hydrochloric acid in the kaline intestine, the calcium becoming carbonated from aste gases. Calcium chloride would appear to be indicated it would correct the alkalotic shift and thereby increase e diminished calcium, while at the same time it would ave a depôt of calcium for absorption. Our patients all ceive 3 g. of calcium chloride daily; this is given as an buminate, and the formula is published.[5]

FIG. 7.



wort adenocarcinoma treated by weekly intravenous injection of lead selenide. Controls left. Note slow rate of growth of controls and much slower growth of the treated animals.

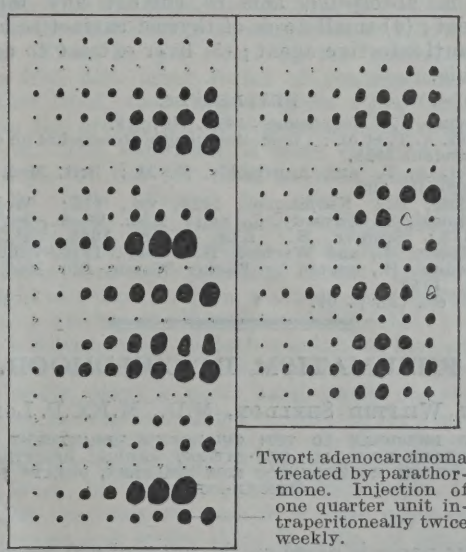
In the hope of increasing the assimilation of calcium, e started giving our patients the fat-soluble vitamins bout a year ago. The fat-soluble vitamins, in ddition to having this remineralising action, are aid, at the present time, to have an anti-infective ction. It would take too long to consider the roblem of cancer as an infective disease, and though any would not subscribe to this belief at present, ow will deny that the advanced cases we treat are condarily infected. The fat-soluble vitamins ould be of help in combating this septic factor. he evidence in the literature is very conflicting as the value of vitamin medication in cancer; the eason may be the different concentrations and ixtures employed by various workers. We have one a good deal of experimentation with vitamin eding of mice with implanted cancer and we can ay, with some assurance, that Ostelin, pure itamin A and pure D all diminish the growth of wort carcinoma. Pure vitamin D, especially, is arkedly inhibitory, the retardation and regression f the implant which follows its ingestion is quite s marked as that of treatment with lead selenide Figs. 5, 6 and 7).‡ Owing to the generosity of the ritish Drug Houses we have been able to treat our uman cases with very large doses of vitamin D of ite; it appears to be really useful when the amount f oily solvent can be tolerated. One instructive ase is worth a brief description here:

About a year ago I was asked to see a patient who had eveloped acute pain in the right chest. A radiogram owed a large solid mass. A little later two nodules appeared in the subcutaneous tissues of the left chest wall. A few days afterwards his right eye became paralysed. On examination I found a complete ophthalmoplegia of the eye, a solid right base, two large masses in the left chest wall and spastic diplegia of the legs. I concluded that this was probably sarcomatosis, and advised excision of one of the superficial masses; this was found to be a polymorph-celled sarcoma, and this diagnosis has been confirmed by several authorities. In view of the rapidity of the symptoms in this case and the scarcity of beds, I advised the patient's doctor that it would be well to wait and watch the rate of growth; if the latter was not so rapid as we thought we would attempt treatment. The patient was advised to rest and to eat as much spinach as possible, and as he had an unlimited supply he ate a great deal. The remaining superficial mass rapidly disappeared, the right base became resonant again and X rays showed no opacity, his diplegia passed off. A few weeks later he came to see me. Then he was able to do what he wanted, which was to go to as many race meetings as possible; provided he covered his lamé eye, he felt very well. This man had no treatment but spinach, a vegetable especially rich in vitamin A and in carotene. His recovery may have been coincidence, but in view of our animal results I am inclined to attribute it to vitamin A. It should be pointed out that after about six months he had a relapse and died.

Besides the fat-soluble vitamins, parathyroid extract increases the calcium of the plasma and tissues. We have observed the effect of this in animals; given by the mouth it appears to have no action. Collip's parathormone, given by injection, however, appears to have a definite retarding action in mice implanted with Twort carcinoma (Fig. 8).

Thyroid extract, a true tonic by virtue of its action in stimulating metabolism and immunity processes, has a place in the treatment of cancer. We usually give a small daily dose. Finally, to combat the anæmia usually present in advanced cancer and the anæmia occasioned by prolonged injection of lead compounds, we give the patients liver extract. Again

FIG. 8.



Twort adenocarcinoma treated by parathormone. Injection of one quarter unit intraperitoneally twice weekly.

we have experimental evidence that animals with implanted cancer do better if given liver extract. We give a daily dose corresponding to four ounces of liver.

Conclusions.

This is, in outline, the treatment we give our patients, and the reasons for giving it. We do not advise anyone to adhere to our programme; we must, for we are in hopes of finding a better treatment. But the method, as we practise it on advanced cases, will probably not reduce the mortality of cancer appreciably. We hope that the surgeon will reduce

‡ The implanted cancer noted here in the animal experiments Twort adenocarcinoma from the Imperial Cancer Research und. We use solely a very slowly growing strain, for the ore rapid strains do not allow sufficient time to observe ie effects of this treatment. This slow strain is maintained y implanting from small, slowly growing tumours. Selenide eatment of rapidly growing implanted cancer has given rela- vely poor results in this laboratory, nothing like the results gured here. The rate of growth can be inferred from the gures; charting commences about four weeks after implanta- on and thence at weekly intervals.

this mortality by applying this method in association with the present surgical procedures:

1. Until we, or others, have found a method for the concurrent treatment by radiation and selenide, to treat such cancers as are likely to be influenced with radiation first, and as thoroughly as possible. After radiation is over and the patient has had time to recover, to treat by this method.

2. In inoperable cancer to remove as much as possible by surgical means and afterwards to try to make the remainder regress with selenide. It seems logical to expect a better, and easier, result when most of the mass has been removed. In cases of cancer with metastases in liver or kidney it will be well to remove the primary growth, for the metastases in liver and kidney appear to require small doses of colloid and do badly on the larger doses required by their primary growths.

3. Especially we advise giving the treatment after operations which are regarded as having been complete. In an unknown percentage of the cases completion has not been achieved and recurrence follows. Since reaction, and adverse effects of the treatment largely depend upon the amount of destruction of the cancer, these cases should and do react little, and the treatment is little hardship.

Finally, we strongly advise that the whole of the method is used; we cannot be sure how much the interaction of the various medicaments conduces to the results we get. That is, we advise that the patient be given: (1) lead selenide to increase local and general defence mechanisms; (2) calcium chloride to increase ionised calcium by acidosis, to correct alkalosis, and to furnish a depot for calcium assimilation; (3) fat-soluble vitamins in large doses, especially vitamin D as Radiostoleum or pure D, to increase calcium absorption and to combat any infective element; (4) small doses of thyroid extract as a tonic and anti-infective agent; (5) liver extract to combat anæmia.

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RHEUMATISM IN CHILDHOOD.

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THIS paper is based on the notes of 600 consecutive cases of rheumatism seen during the last two years at the rheumatic clinic of the Hospital for Sick Children, Great Ormond-street. Many were under observation during the whole of this period.

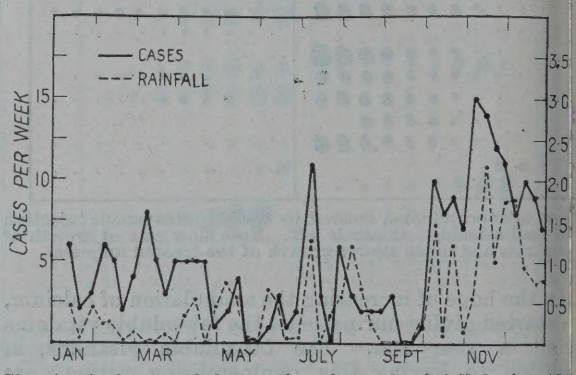
The children can conveniently be divided into four groups: (1) those with rheumatic pains in the limbs (235); (2) those with a history of rheumatic fever or acute articular rheumatism (133); (3) those with chorea (197); (4) those with rheumatic heart disease (266).

Rheumatic Pains.

Children who complain of recurring pains in the limbs form an important group in a rheumatic clinic because of the possibility that some of them ma later on develop heart disease. The joint pains tha occur with rheumatic fever are not included in th group.

Rheumatic pains are seldom met with before th age of 3 years. Although most common in the leg they also occur in the arms, over the shoulders, an round the neck. Usually they can be localised b the child to some definite area of the limb, often i the neighbourhood of joints although not actuall in the joints; at all events, movement of the join does not give rise to pain, nor is there any limitatio of joint movement. The pains are persistent, an often make the child restless. In some cases th pains are localised over the origin and insertion muscles, the insertion of the deltoid and corac brachialis being a frequent site. Pains in the che are also common, and are possibly connected with th intercostal muscles and ligaments. In some childre

FIG. 1.



Showing incidence of rheumatic pains and rainfall during 19

the pains seem to be particularly frequent at nig soon after the child has got into bed; such night pai can often be eliminated by putting the child to sle between blankets. Pains that occur during the d are as frequent in the morning as in the evenin and are not related to fatigue.

There seems little doubt that the incidence rheumatic pains bears some relation to cold and w weather. In Fig. 1 the continuous line represen the number of children per week who complained pains in the limbs while attending the rheumat clinic at Great Ormond-street during 1929. The brok line represents the weekly measurements of rainf in inches recorded at Camden-square, N.W., duri the same period. For these latter figures I a indebted to the British Rainfall Association. The is sufficient parallelism between the two lines justify further investigation into this aspect rheumatism. A discrepancy between the lines obvious in March when, although rain fell on one d only, the incidence of rheumatic pains remain practically constant. Following upon a fairly d May and June, the first week of July was very w and complaints of limb pains were then numerou September was a month of drought, and there we practically no complaints of pains. The droug terminated in the first week of October, and with t fall of rain complaints of pains were resumed.

The pathological process concerned in the producti of rheumatic pains is uncertain, and the evidence f regarding them as rheumatic rests on their clinic association with other manifestations of rheumatis In 52 out of 266 children with rheumatic heart diseas pains in the limbs over several months was the on evidence of rheumatism that preceded the discove

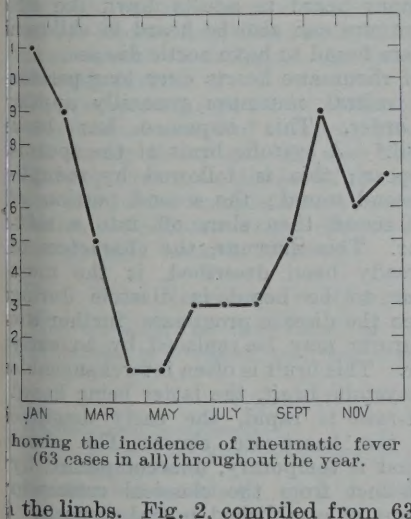
f the heart lesion. A history of pains in the limbs receded 15 out of 197 cases of chorea. The common mpression that these pains afford early evidence of heumatic infection is borne out by these figures. t is unusual for the reverse to happen—namely, that ains in the limbs should be a late symptom of heumatism, appearing for the first time several ionths or years after a child has shown other signs f rheumatic infection.

In the treatment of children suffering from rheuatic pains general hygienic measures are of the first mportance. It is significant that rheumatic children ractically never complain of pains while they are way at a convalescent home. Damp, draughty houses redispose to these pains, new houses being often s bad in these respects as old ones. Thick boots nd long stockings should be worn, and in wet weather rovision should be made for the child to be able to hange into dry shoes at school. Sleeping between lankets should be advised. Sodium salicylate, hich is of great service in acute articular rheumatism, often disappointing in dealing with these pains. t has been used in doses of grs. 5 and 10 once or wice a day, with inconstant results, and sometimes he drug has seemed to depress the children and interre with the appetite. The external application of niment of methyl salicylate has been found more elpful; rubbing with the liniment for a few minutes ill generally dispel the pains which, however, are kely to return so long as the general health remains nimproved. For this purpose a period of conalescence and the judicious use of a suitable tonic, uch as equal parts of the syrup of the iodide of iron nd malt, are often of value.

Rheumatic Fever.

In common with the other rheumatic manifestations, heumatic fever, or acute articular rheumatism, is rarely encountered before the age of 3 years. Out of 133 instances of acute articular rheumatism, the youngest example occurred in a child 2½ years old, and three cases developed at the age of 3 years. Rheumatic fever is particularly likely to occur during the cold and wet months, being in this respect similar to rheumatic pains in the limbs. Fig. 2, compiled from 63 cases of rheuatic fever, gives the number of cases occurring in ach month of the year, and shows how the incidence f the condition falls off during the summer months.

FIG. 2.



howing the incidence of rheumatic fever (63 cases in all) throughout the year.

A feature of rheumatic infection, no matter what inical form it takes, is the inability of the patient to stablish a lasting immunity after one attack. Of he 133 cases now under discussion, 21 experienced a econd attack and two had three attacks. The shortest nterval between any two attacks was six months.

The symptoms of rheumatic fever are often milder in childhood than in adults, and the classical description of painful swollen red joints, one joint being affected after another, is not always seen. The affected joint is invariably painful, but swelling is not always evident, while a red flush over the joint is less common than swelling. Occasionally only one joint is affected.

The relation between rheumatic fever and heart disease is too well recognised to need discussion. Coombs [1] has recently stated that every child with rheumatic polyarthritis may be assumed to have an infected heart also, although clinical evidence of the heart affection may not always be found. Of the 133 cases of rheumatic fever at the clinic at the Hospital for Sick Children, 93 (70 per cent.) showed evidence afterwards of cardiac involvement. Of the remainder, rheumatic fever was followed by chorea in five cases, and by pains in the limbs in 12 cases. Only 23 children (17 per cent.) have been entirely free of rheumatic symptoms since their attack of rheumatic fever. These figures illustrate the necessity of keeping under observation for some time children who have once had rheumatic fever. The supervision of these children should be one of the functions of a rheumatic clinic.

Chorea.

The age incidence of chorea begins a little later than the other manifestations of rheumatism, being uncommon before the age of 5 years, when schooling begins. Poynton [2] has recorded an example of rheumatic chorea in a baby of 10 months. Sydenham's chorea is so often associated with other forms of rheumatism that it is now generally accepted as a rheumatic manifestation. Of 197 cases of chorea at the rheumatic clinic at Great Ormond-street rheumatic heart disease occurred in 52, rheumatic fever preceded five cases, and in 15 instances rheumatic pains in the limbs either accompanied or followed the chorea. Thus 36 per cent. of the children with chorea had also other forms of rheumatism. On the other hand, there appear to be other factors at work in the production of chorea besides rheumatic infection. The condition is more common in girls than boys—of the 197 children with chorea, there were 2·1 girls affected for every boy—whereas rheumatic fever and rheumatic carditis are evenly distributed between the sexes. The onset of chorea often dates from some psychical shock. In one child the fright of a thunderstorm was sufficient to start the chorea; a caning at school preceded another; minor street accidents seem to be becoming an increasingly common forerunner. The mental stress of education undoubtedly plays a part, particularly competitive education such as is entailed in working for a scholarship. Children who are apt to develop chorea are almost always quick and intelligent and keen on their school work, but for the sake of their health it is a pity that they cannot work in a class where marks do not exist and where there is neither a top nor a bottom place. I have endeavoured to obtain figures showing the effect of schooling upon the production of first and later attacks of chorea, but this has proved impracticable. In this connexion the school medical service should be able to gather valuable information.

TABLE I.

Children attending clinic after—			
1st attack of chorea ..	142	4th attack of chorea ..	3
2nd ,, ,, ,, ..	40	5th ,, ,, ,, ...	1
3rd ,, ,, ,, ..	9	6th ,, ,, ,, ...	2

Chorea is very likely to relapse. From Table I. it may be seen that one or more relapses occurred in 28 per cent. of 197 children.

TREATMENT.

There is little doubt that, in the treatment of acute chorea, rest in bed is the most important factor. Difficulty arises when the choreic child has recovered sufficiently to return home. When should the child go back to school? Here no general rule can be laid down. At the clinic at the Hospital for Sick Children the average time that children with chorea have been exempt from school has been six months. This has seemed unnecessarily long in some cases, while others have relapsed on returning to school after an absence of 12 months. The home circumstances must influence the decision. If absence from school implies that the child will spend most of the day in the street dodging traffic it is better for that child to return to school early. When there is a garden and the mother or some other responsible person is at home all day, six months away from school should be a minimum. A stay at a convalescent home is valuable, particularly if a mild amount of education can be combined with the convalescence. In many cases half-day attendance at school for two or three months before allowing whole-day attendance has proved useful. Once a choreic child returns to school he soon makes up the ground lost through absence. Close coöperation with the school medical service and the education authorities is essential in the management of these children.

Rheumatic Heart Disease.

Of the 600 children with rheumatism whose notes have been analysed, 266 were found to have heart disease—a percentage of 44. Table II. summarises the evidence of rheumatic infection being present before the onset of heart disease.

TABLE II.

	Cases.
Acute articular rheumatism preceded carditis in ..	87
Chorea preceded carditis in	52
Recurrent pains in the limbs preceded carditis in	52
Tonsillitis—no other symptoms—preceded carditis in	7
Carditis dating from scarlet fever	10
Carditis dating from diphtheria	4
Carditis dating from tonsillectomy	2
Insidious—no preceding rheumatic history	36

The group in this Table to which I wish to allude is the last—the 36 cases of insidious heart disease. In these a careful inquiry into the child's history failed to reveal any item suggestive of rheumatism. Unfortunately, the rheumatic process seems to be none the less destructive for being insidious in onset. Of the 36 children only one has recovered. This was a boy who was found to have a dilated heart with an apical systolic bruit; 18 months later the heart became normal. Four children of this group first attended with systolic and mid-diastolic apical murmurs; the mid-diastolic element has now gone, although the systolic murmur persists. Of the remainder, 24 have a well-marked mitral systolic murmur and four of these are certainly proceeding to stenosis. One boy has aortic regurgitation, while of six children who have attended with mitral stenosis of insidious origin two have died. Rheumatic heart disease coming on insidiously tends to run a slowly progressive course, which it is difficult to influence by therapeutic measures.

The early diagnosis of rheumatic heart disease may sometimes offer considerable difficulty when a child has a soft systolic bruit at the apex, but the heart is not enlarged. In many of these the bruit is temporary and disappears when the general health improves. A history of acute rheumatism or chorea suggests that the bruit is organic. Organic systolic murmurs are often more easily heard when the child is lying down or lying on his left side than when he is standing up. They also show little variation with inspiration and expiration. Such cases as these, in which the diagnosis of rheumatic disease of the heart is in doubt, may with advantage be supervised in a rheumatic clinic for a few months, until the significance of the bruit has been determined.

The presence of a murmur at the apex during diastole is a valuable sign of organic disease. The most common murmur to be heard during this period is a mid-diastolic murmur, and this often enables one to be sure that a systolic bruit is organic. In order to hear a mid-diastolic murmur it is generally necessary to have the child lying down. The murmur is separated from the second sound by a short interval, giving rise to three sounds at the apex—a systolic murmur, then the second sound, followed by the mid-diastolic murmur. Its point of maximum intensity is a little internal to the apex-beat, and it is very localised, seldom covering an area more than an inch or an inch and a half in diameter. The following case throws some light on the way in which this murmur is produced:—

A girl, aged 5, was sent to the rheumatic clinic on account of heart disease. She was found to have complete heart block, the ventricular rate being 44 per minute, while the auricle was beating at 80 per minute. In addition to a systolic murmur at the base of the heart, there were systolic and mid-diastolic murmurs at the apex. The mid-diastolic murmur occurred 44 times each minute, which indicated that it was produced by the action of the ventricle rather than by that of the auricle.

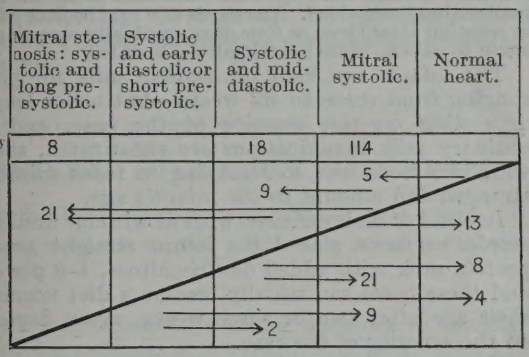
It seems likely that the murmur is due to the ventricle sucking blood from the auricle during diastole through a thickened or stiffening mitral valve. Sutherland[3] has expressed the view that the diastolic murmurs at the apex in rheumatic heart disease originate from the aortic valve, but there is little to support this. Other evidence of aortic disease, such as Corrigan's pulse and a big pulse pressure, is wanting; moreover, the typical aortic regurgitant murmur heard in adults down the left border of the sternum can also be heard in children who at autopsy are found to have aortic disease.

Observation of rheumatic hearts over long periods shows that the mitral murmurs generally appear in a definite order. This sequence has been described by Still.[4] A systolic bruit at the apex is the first to appear; this is followed by reduplication of the second sound; the second portion of the reduplicated sound then slurs off into a mid-diastolic murmur. This murmur, the characters of which have already been described, is the most common murmur to be heard in diastole during childhood. When the disease progresses further the mid-diastolic murmur may be replaced by an early diastolic murmur. This bruit is often interchangeable with a short presystolic bruit, the latter being heard when the heart-rate is rapid, the early diastolic reappearing as the heart-rate slows. The short presystolic murmur is temporary, unaccompanied by a thrill, and distinct from the classical crescendo presystolic murmur of established mitral stenosis.

When the acute infection of the heart subsides the murmurs just described will often be found to retrace their steps. After a few months the early diastolic and short presystolic murmurs settle down into a mid-diastolic bruit, which may persist for several months or years. In some cases the mid-diastolic bruit reverts to a reduplicated second sound, which gradually returns to a normal second sound. In a few cases the systolic murmur also disappears and, as far as one can tell, the heart is then normal. On

The other hand, mitral stenosis may slowly develop from the stage of systolic and diastolic bruits; the first sound at the apex then gradually becomes sharper and louder, while the mid-diastolic murmur sinks up with the first sound until finally the long rumbling presystolic murmur characteristic of mitral stenosis is fully developed. Mitral stenosis does not develop for several years after the original attack of endocarditis. Of the cases analysed, three years was the shortest period in which mitral stenosis developed, but often double that time is required. Fig. 3 shows how the mitral murmurs in 232 children have

FIG. 3.



Illustrating the progress of mitral murmurs towards stenosis (above oblique line) and towards recovery (below line) in 232 children.

changed during a period of from one to two years' observation. The murmurs have remained unchanged in 140, 21 are proceeding to mitral stenosis, while 12 have lost their diastolic murmurs, and in 25 the heart has become normal.

Aortic regurgitation was present in 6 per cent. of 266 children with rheumatic heart disease, a figure which agrees closely with that of other observers. Rheumatic nodules in the subcutaneous tissues, most commonly over the elbows, knuckles, knees, ankles, and occiput, almost invariably indicate the presence of active rheumatic carditis.

The recuperative power of children against disease is a continual source of encouragement to those who work among them, and the very fact that children with early rheumatic disease of the heart are in some cases capable of completely overcoming their heart affection stimulates every effort to help them in their struggle towards recovery.

Tonsillectomy in Rheumatism.

The question of the value of tonsillectomy in rheumatism is a vexed one, and much has recently been written on the subject. Of 600 consecutive cases of rheumatism at the rheumatic clinic at Great Ormond-street tonsillectomy has been performed on no less than 540 (90 per cent.). Of these, 393 were operated upon before their admission to the clinic. Table III. shows the relation between operation for removal of tonsils and the onset of rheumatic pains (174 cases), chorea (143 cases), and rheumatic fever (111 cases). Cases in which visible tonsil remnants remained after the operation have not been included in this Table.

TABLE III.

Rheumatic pains occurred—		
Before and not after tonsillectomy in	.. ..	52 cases.
Before and after ,,	.. ..	53 ,,
After and not before ,,	.. ..	69 ,,
Chorea occurred—		
Before and not after tonsillectomy in	.. ..	73 ,,
Before and after ,,	.. ..	20 ,,
After and not before ,,	.. ..	50 ,,
Rheumatic fever occurred—		
Before and not after tonsillectomy in	.. ..	71 ,,
Before and after ,,	.. ..	4 ,,
After and not before ,,	.. ..	36 ,,

These figures show that approximately one-third of the cases of rheumatic pains, chorea, and rheumatic fever commence these symptoms of rheumatic infection after the tonsils have been removed. In addition, the pains continued after the operation in half of 105 children who had rheumatic pains in the limbs before the removal of their tonsils; and of 93 children who had chorea before removal of their tonsils the chorea relapsed after the operation in 27 per cent.

Unless it can be shown that tonsillectomy has a definite influence in the prevention of cardiac disease, there seems small justification for the operation merely on the ground that the child is a rheumatic subject. Miller[5] has suggested that tonsillectomy is a useful prophylactic measure against rheumatic heart disease, but convincing proof either for or against this view is most difficult to establish. Analysis of 266 children with rheumatic heart disease showed that in 46 cases (17 per cent.) the tonsils had been removed before signs of cardiac disease were discovered. It seems more probable that the value of tonsillectomy in rheumatic children is in proportion to the degree of impairment of the general health attributable to the tonsils. In other words, the tonsils of rheumatic children should not be removed unless there is evidence that they are affecting the general health adversely. Such evidence as a history of repeated sore-throats, chronic enlargement of the tonsillar glands in the neck, and the appearance of the tonsils must all be taken into consideration. The size of the tonsils alone is an unreliable guide, small scarred tonsils being often as injurious to the child's health as hypertrophied tonsils.

I wish to express my sincere thanks to the medical staff of the Hospital for Sick Children, Great Ormond-street, for their permission to make use of figures gathered from the rheumatic clinic.

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WILLESDEN CANCER CLINICS.—The report of the first six months' work of the Cancer Clinics, opened by the Willesden Urban District Council, shows that 52 patients attended, most of whom had been attracted by advertisements, posters, and leaflets. In 18 cases the advertisements of various kinds had awakened fear that some condition which had been looked upon as trivial might be cancer, and one patient actually was found to be suffering from cancer in an early stage. Of the others, 17 had "conditions requiring operation or treatment;" 11 had "conditions known to be forerunners of cancer," while six were suffering from conditions the relationships of which to cancer have not yet been established. In 20 cases it was possible to make a definite statement that the patient was not suffering from cancer. The report adds that the clinics have been the means of securing treatment for 12 patients suffering from cancerous or pre-cancerous conditions at a stage of the disease when there is every reason to believe that a cure will be effected or the danger removed.

CLINICAL AND LABORATORY NOTES

PROTEIN MILK IN INFANT FEEDING.

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PROTEIN milk, or the *Eiweiss-Milch* of Finkelstein, has long been in use both on the Continent and in America as a milk modification suitable for the feeding and treatment of infants suffering from the various forms of diarrhœa and malnutrition. Its value in these conditions does not appear to have been fully appreciated in this country, and although recently the English literature has contained several accounts of feeding with acidified and lactic acid milk, little or nothing has been written concerning protein milk, whilst even the latest text-books contain scant information regarding its application.

Protein milk is prepared, roughly, by rubbing through a fine sieve the dried curd obtained by coagulating a quart of milk with rennet, gradually adding to this curd a pint of buttermilk and making up to the quart with boiled water. Dried varieties are now on the market. The composition of this mixture differs somewhat according to the amount of fat in the milk employed; Holt [1] gives the average as: protein 3·75 per cent., fat 3–3·5 per cent., sugar 1·8 per cent., salts 0·65 per cent.; whilst Langstein and Meyer [2] give: protein 2·8–3 per cent., fat 2–2·5 per cent., sugar 1·2–1·6 per cent., and salts 0·45–0·5 per cent. The calorie value is from 12–14 per ounce.

The advantages of this milk are: (1) the high protein content tends to make the stools less frequent and also alkaline; (2) the small amount of sugar minimises the risk of fermentation; (3) the moderate fat forms soaps which favour the production of formed stools; and (4) the presence of lactic acid makes the curd more easily digested.

As the preparation of fresh protein milk takes a great deal of time and trouble, and as it appears to have no advantage over the dried variety, we have used the latter in all cases, the percentage composition approximating to the higher values in Langstein and Meyer's table. This mixture has a calorie value of about 12 calories to the ounce, and we have used the standard strength in all cases of whatever age. As one of us (N. H.) has now been using this milk for some four years, it seemed to us that a useful purpose might be served in briefly summarising the results.

A SERIES OF CASES FED ON PROTEIN MILK.

Rather less than a hundred cases altogether have been fed on protein milk, a number which we realise is small. In the early trials only the most severe and often apparently hopeless cases of ileocolitis were given it, so that any attempt to prove its efficacy or otherwise by mortality-rates would be fallacious. Latterly we have given this milk early in the disease and kept the infants on it for longer periods, a procedure which we found fully justified by results. In cases of severe ileocolitis our routine is now as follows.

If the infant is not too collapsed and dehydrated, an initial dose of castor oil is given, and the child is fed for the first 12–24 hours on boiled water sweetened with saccharine or 5 per cent. lactose. After this, protein milk is started, at first with no added sugar but sweetened with saccharine gr. 1 to the quart. The sweetening is important, as not a few infants refuse to take protein milk unsweetened, as it has a peculiar, rather sour and unpleasant taste. As soon as the stools have started to improve, which occurs as a rule in one to four days, dextrimaltose is added, at first in very small quantities (half a drachm per feed) and then gradually increasing until eventually 6–10 per cent. has been added. We have been guided in the rate of addition by the state of the stools, it being possible in some cases to add much more rapidly than in others. For the first few days the infant may lose weight, or the weight remain stationary, but often after the first few days the weight increases even before the dextrimaltose has been added. The stools as a rule become alkaline in reaction after three or four days, gradually changing back again to acid as more dextrimaltose is added.

The infants are kept on protein milk for periods ranging from three to six weeks—but never longer—depending on the severity of the case, and then ordinary milk modifications are substituted, starting with two feeds and so returning to feeds suitable in strength and amount to the infant's age.

In cases of malnutrition, with or without undigested stools, we have placed the infant straight away on protein milk with added dextrimaltose, 4–6 per cent., and these cases can usually resume a diet normal for their age after two or three weeks, again depending on the severity of the case.

Two cases of the series in which this milk was used were cases of hypertrophic stenosis of the pylorus with the loose and frequent stools which occasionally follow operation. In both cases the condition rapidly improved and the infants recovered. The youngest case in our series was aged 3 weeks, an infant which was sent to hospital on account of vomiting and loss of weight and suspected duodenal stenosis. This infant took the protein milk well, gained weight, and left the hospital thriving on a simple milk modification.

We have made no fixed rule for the quantity and frequency of feeding, and treat each infant individually, giving as a rule sufficient protein milk to satisfy. Infants fed on this milk sometimes become constipated, but this can usually be overcome by the addition of more dextrimaltose to the feed.

A definite advantage when feeding with protein milk, in cases either of ileocolitis or malnutrition, is that a return to an ordinary feed suited to the infant's age may be made more quickly than when using ordinary milk or dried milk modifications. We have found this fairly consistently and, in addition to benefiting the infant, it enables the institution to employ its accommodation to the best advantage. An occasional difficulty arises in cases of ileocolitis when the protein milk without added dextrimaltose has led to an improvement in the stools, but the stools have relapsed as soon as any dextrimaltose was added and the infant's general condition has become worse, whilst without the added dextrimaltose the feeds were not of sufficiently high calorie value for the infant even to maintain its weight. Some of these infants were tried on other foods without success, whilst in others we attempted to add dextrimaltose, also without success.

COMMENTS.

We consider that protein milk is of very definite help in certain difficult cases of infant feeding, and in many cases in our series it appeared to be the only mixture which the infant would tolerate. Griffith and Mitchell,[3] in discussing protein milk,

[1] Holt: Diseases of Infancy and Childhood. New York. 1926, p. 129.
[2] Abt's Pediatrics. Philadelphia, 1923, vol. ii., p. 749.
[3] Griffith and Mitchell: Diseases of Infants and Children. Philadelphia, 1927, vol. i., p. 158.

state that "although the truth of the original theories which led to the production of casein milk seems repeatedly to have been disproved, the fact remains that the preparation is one of very great value, particularly in many diarrhœal disturbances in infancy." With this we are in complete agreement.

The main points to remember when using protein milk are: (1) that it is a "medicinal food" and that infants should not be kept on it for more than six weeks; (2) that saccharine should be used for sweetening purposes at the onset in cases of ileocolitis; (3) that no gain in weight can be expected until sugar in the form of dextrimaltose is added, and this addition should never be delayed for more than a few days; (4) that although protein milk is a most useful adjunct to infant feeding, it must not be considered as a panacea for every nutritional disturbance occurring in infancy.

CATHETER-EXTRACTION OF A URETERAL STONE PER URETHRAM.

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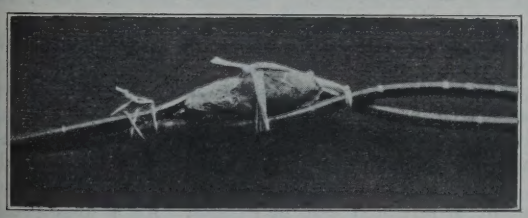
Urologists are always urging surgeons to attempt non-cutting methods in the removal of stone from the urinary tract. That manipulation may occasionally be successful is illustrated by the following case.

An Arab male, aged 40, was admitted on Nov. 5th, 1928, with a vesical fistula following a suprapubic cystotomy for stone, performed elsewhere. His general condition was poor, and all urine came through the suprapubic cystotomy, in the scar of which a keloid had developed. On the follow-



Stone removed per urethram. It measured 1·8 × 0·8 cm.

ing day the scar was excised and the bladder drained. On Dec. 4th a stone impacted in the urethra was removed by external urethrotomy. On Jan. 10th, 1929, he underwent a second operation to close the suprapubic fistula, and yet a third on Feb. 5th. The last was successful. On March 4th the urine was still dirty, and a complete X ray examination was repeated, and revealed: (1) a stone in the right ureter, (2) a stone in the pelvis of the left kidney.

In view of the poor general condition of the patient it was decided to attempt to dislodge the ureteral calculus by catheterisation. Two ureteral catheters were passed well up the right ureter, and X rays showed them lying one on each side of the stone. On removing the catheters with considerable effort, something, presumably the stone, was felt to give, though at the moment it seemed probable that the catheters had broken off in the ureter. Next day the procedure was repeated; only after passing the catheters well up towards the kidney it was decided slowly to twist them round and round before pulling them down.

This manœuvre apparently freed the stone from the ureteral wall and at the same time secured a firm grip for the catheters, for on slowly withdrawing them, while keeping up a twisting movement, the calculus was safely delivered at the meatus. The most I had hoped for was a dislodgment into the bladder, but apparently the mouth of the ureter had been drawn down to the orifice of the prostatic urethra, and the transit of the bladder was thus safely accomplished. It seems important to pass the catheters as high as possible towards the kidney. The passage of three or four very fine catheters or sounds might make the result more certain.

It is difficult to explain how it was that on two successive occasions the catheters passed up one on each side of the stone. The whole operation was performed without an anæsthetic, local or general, and patient experienced only moderate pain.

The cases in which manipulative removal of ureteral stones should be attempted must always remain rare, more particularly in view of the fact that the operation of ureterolithotomy is comparatively safe. Personally I would strongly deprecate the use of all special instruments, however ingenious, as their danger increases in direct ratio to their efficiency. The method described of twisting catheters appears worthy of trial.

A CASE OF ECLAMPSIA TREATED WITH SPINAL ANÆSTHESIA.

By R. H. Paramore, F.R.C.S. Eng.,
Gynæcological Surgeon to the Hospital of St. Cross, Rugby.

All cases of eclampsia are of interest, and the one here reported is of especial interest because, in spite of spinal anæsthesia, and even after Cæsarean section and decapsulation of the right kidney, further fits appeared—due apparently in part to the effect of pituitrin.

RECORD OF THE CASE.

The patient was a well-developed primigravida aged 24, seven months pregnant. She was admitted to the Hospital of St. Cross, Rugby, on March 10th, 1930, comatose from eclampsia. She had noticed swelling of the ankles and hands for three or four weeks. On the advice of a nurse who found albumin in the urine, she consulted a doctor (March 5th) but disregarded instructions. The day before admission (Sunday, March 9th) she was up and about, and helped in the cooking. At dinner she ate meat, potatoes, peas, and Yorkshire pudding. She rested in the afternoon, but at supper (9 P.M.) had more peas. At 9.30 P.M. she went to bed, complaining of headache. During the night (3.30 A.M.) she awoke her husband, complaining of feeling unwell. He discovered her in a fit on his return from fetching her mother. Two further fits occurred at intervals of an hour's duration. The doctor was called and gave the patient a quarter grain of morphia and sent her to hospital a distance of ten miles. In the ambulance she had another fit.

She was admitted at 8 A.M., and had a further fit at 9.25 A.M. Chloroform was given. Eight ounces of highly albuminous urine were obtained by catheter, but did not boil solid. A simple enema was without effect, the injection being retained. I saw her soon after; she then looked bloated and was semi-comatose and lying on her back. At 10.45 A.M. spinal anæsthesia (tropacocaine 1·5 c.cm.) was induced under chloroform; she struggled a good deal. She was kept well over in the left lateral position, and the foot of the bed was raised on blocks. At 2 o'clock her condition was rather improved, and there had been no further fit.

The next day (March 11th) she was much better. A good deal of urine had been passed and the bowels had been opened. The blood pressure was 160/95. Water, solution of glucose, lemon water, or water with sodium bicarbonate only were allowed. The day after (March 12th) she was very much better and seemed to be improving fast. Eighteen ounces of urine had been collected, but it still contained a great deal of albumin. The child was alive.

The problem of the renal state—now the central question—was considered; it was thought that the pregnancy must be terminated if the albumin did not diminish rapidly. Hot baths thrice daily were ordered. On March 13th the patient had three hot baths, and on the 14th she had one, but they seemed to do more harm than good. On the 13th she appeared still better; 38 oz. of urine had been collected but it still contained much albumin. The blood pressure was 150/100. But on the 14th she did not look so well—she looked confused. Getting to the bath and back—even with a chair—seemed to have prejudiced her recovery, and that evening the fits recurred. She had one, at 8.40 P.M., for which chloroform was given, and another at 9.14 P.M. Chloroform and spinal anæsthesia were

repeated, and it was decided to empty the uterus and incise the capsule of the right kidney.

At 10.45 P.M. Cæsarean section was done under chloroform, and a small living child (3 lb.) was delivered; pituitrin, 1 c.cm., was given. The abdominal incision was extended upwards and the intestines packed to the left. The peritoneum over the right kidney was incised and its capsule split. By a stab wound in the loin a tube was inserted to drain the kidney area. The peritoneum over the kidney was sewn up, and the abdominal wound closed in the usual manner, without drainage. Omnopon, 1 c.cm., was injected after the operation and, by some extraordinary fatuity, pituitrin, ½ c.cm., was given every four hours. The next day she did not seem to have responded to the treatment as I expected. She did not seem to be passing as much water as she should have been doing. It was not clear to me then that the pituitrin was probably the cause, but it was stopped early in the afternoon of that day. In spite of that, however, the patient had another fit at 4.5 P.M. and a further severe one at 5.40 P.M. For both of these chloroform was given, and at 6 P.M. spinal anæsthesia was induced for the third time. With the patient still under the influence of the chloroform, the rectum was washed out. Yet during the night (2.55 A.M.) a further fit occurred, chloroform and omnopon being given. This was the last. At 7.15 A.M. a simple enema produced a good result; but the omnopon was repeated as a precaution.

On March 17th the patient was much better, the urine increasing, and no further fit had occurred. On the 18th she was so much better as to appear nearly normal; she was sleeping a great deal. On the 19th she appeared to be convalescing rapidly, and only a trace of albumin was found in the urine. On the 21st she was smiling and spoke normally: the œdema had all gone and she did not remember her illness. The wound in the loin was nearly healed and the abdominal wound was normal. The temperature had remained normal. She left the hospital with scarcely any albumin on April 5th. The child did not survive the third day.

DISCUSSION.

As in two former cases,[1] [2] spinal anæsthesia seemed highly efficacious in stopping the fits but in this patient the fits recurred. This is partly to be attributed to the visceral state, which was worse in this case than in the others, as shown by the œdema and the marked albuminuria. Tropacocaine, which acts by reducing the tonicity of the abdominal wall muscles and the blood pressure, cannot be expected to cause more than fleeting changes. Its effect only lasts about an hour and it is thus much more likely to be of service in the fulminating cases of eclampsia—in which a relatively sudden visceral block (to the blood flow) has occurred—than in those in which the pathological process has been progressing more gradually.

In the present case, however, two other factors seem to have come into play. The attempt to deal with the renal state by means of hot baths seems to have precipitated subsequent attacks, whilst the use of pituitrin seems to have determined their persistence. I cannot but think that the hot baths would have been without misadventure—and all for the good—could the patient have been lifted from her bed into the bath, but getting out of bed into the wheeled chair and from the chair into the bath and the return to bed were too much. The visceral block was made worse by the movements and the strain of standing.

It was amazing that the Cæsarean section and incision of the renal capsule should have been followed by further convulsions. The patient had not been fed during her illness in hospital; she had been starved, had been given only water, or water and glucose, or lemon water, and had had no milk. Not only did the fits stop but the urine increased when the pituitrin was stopped, after an interval. In this respect, the reference by Dale[3] to the "long persistent" "antidiuretic" effect of "vasopressin"—one of the active principles of pituitrin—is of interest. If pituitrin has such an effect, the action of spinal anæsthesia, which seems to favour diuresis in eclamptic cases,[4] is not likely to operate. While pituitrin act by constricting the renal arterioles, the spinal anæs thetic operates by reducing the compression of th renal capillaries.

Reflection on these points recalled an earlie experience.

In April, 1928, I performed Cæsarean section on a mult para of 38 because she had a small round pelvis and albu minuria. It was her third pregnancy and she was in labou Albuminuria had complicated her second pregnancy, whic had ended in miscarriage. The operation was performe in the morning under spinal anæsthesia and pituitrin wa injected after the child was extracted. This was quit unnecessary, for the spinal anæsthetic acted well as hæmostatic—as Whitehouse and Featherstone [5] hav recently repeated that it usually does. Throughout th afternoon the patient complained bitterly of "after-pains, and at 7 P.M. had an eclamptic fit.

It almost seems that pituitrin, when injected int women on the verge of eclampsia, induces the fits. I certainly affects the renal vessels; experimentally i has been shown that pituitrin "in a dramatic fashion inhibits the ingravescent polyuria of the heart-lung kidney preparation (Verney [6]). In this respect it i interesting to recall the insistence with which Nichol son [7] long ago emphasised the presence in the bloo of a body acting like digitalis and at times eve constricting renal arterioles to obliteration to explai the state of the kidney and the oliguria or anuri associated with eclampsia. The state of the kidne in pregnant women which predisposes to eclampsia however, is not occasioned by a rising percentage o an increased activity of such a body in the blood but pituitrin injected into an individual whos viscera are already in a state predisposing to a meta bolic convulsion is another matter. Pituitrin i largely used in obstetric practice, and, it seems to me rather indiscriminately. Possibly this may partl explain the occurrence of some or perhaps many case of post-partum eclampsia.

The moral seems to be that pituitrin should not b given as a routine after labour, particularly in case in which eclampsia appears in the least likely—e.g cases with headache, œdema, albuminuria, oliguria Pituitrin after labour is given to prevent or chec bleeding; it should not be forgotten that bleedin at parturition is a normal occurrence and has beneficial effect if not in excess. As a prophylacti for eclampsia, bleeding from the uterus is as effica cious as venesection. Moreover, since the bloo volume increases during pregnancy and must b reduced after the delivery for the normal to b reached, the woman can well afford to lose a certai amount.

I wish to thank Dr. Kremer, the resident medical office who was in charge, for his interest in the case reported an for his care in looking after the patient.

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SKIPTON DISTRICT HOSPITAL.—After a long loca discussion the hospital committee have decided to convert large house, named Whinfield, with additions, into a hospita which it is expected will ultimately contain 66 beds. Th total cost, including that of acquisition, will be £11,15 It is proposed to extend the building by the addition of two-storeyed block.

MEDICAL SOCIETIES

EIGHTH INTERNATIONAL CONGRESS OF DERMATOLOGY AND SYPHILIS.

COPENHAGEN, AUGUST 5TH–9TH.

(FROM A SPECIAL CORRESPONDENT.)

Eczema.

As anticipated in your columns, the discussion on the ætiology and pathogenesis of eczema proved to be the most important item on the programme at Copenhagen, and was attended by the whole Congress. It was introduced by Prof. J. Darier (Paris) and Prof. J. Jadassohn (Breslau), who emphasised the main points of their introductory papers, which had been circulated in advance. Prof. Darier took the view that eczema is a clinical entity only in so far as concerns its histology, which is that of a serous exudation in the Malpighian layers (spongiosis), whatever its cause may be. It is, in effect, an "intolerance" of the epidermis to certain stimuli, which vary in quality and degree. It is a vital reaction, and the phenomena implicated do not lend themselves to dogmatic generalisations. Prof. Jadassohn's contribution, which included a somewhat cumbersome classification, was more categorical. He withdrew from the picture the pyodermias, the reactions to fungi, seborrhœic manifestations, and the so-called lichenoid eruptions, and proposed to admit for consideration under the term of eczema only those reactions caused by chemical or physical stimuli, the histological and clinical manifestations of which are well known. They are all of an "allergic" type—that is to say, they occur only in persons of a specific susceptibility, which can be either inborn or acquired—and the causal agent (the antigen) to which they react, and which can nowadays be ascertained by various means, may be either single or multiple. The work of Prof. Bruno Bloch (Zürich), who followed as a "Co-Rapporteur" of the discussion, introduces a new phase into our conceptions of the pathogenesis of the disease, and opens up a fresh avenue of research. As already noted in THE LANCET,[1] he has succeeded in reproducing the clinical and histological picture of eczema in animals. Guinea-pigs have been permanently sensitised by cutaneous applications, intradermal and intracardiac injections of concentrated extract of the *Primula obconica*, contact with which is sometimes a cause of eczema in susceptible human subjects. It is therefore proved that the "antigen" of an eczema—i.e., its cause—can reach the skin either directly or from the blood stream, and when it is known the prophylaxis and therapy are not far to seek. The whole problem depends for its solution on the elucidation and recognition in the future of hitherto unknown causes, and these may be either of external (exogenous) or internal (endogenous) origin. Regarded in the light of these researches eczema is, in the great majority of cases, a specific reaction of the epidermal cells to *exogenous* toxæ, which can be discovered by the investigator in proportion to his care and experience in weighing up the evidence afforded by the history, occupation or trade, environment, and the way of life of the individual patient. The cutaneous tests of certain food antigens appear to be of considerable value in this connexion, and some new work by Gardner and Keston (New York), on Specific Sensitisation in Eczema, read at this Congress, comes at an opportune moment. It is suggested by Gardner and Keston that infantile eczema is the result of a susceptibility to a certain food. If this is not recognised and the reaction persists, the skin becomes more sensitive and may react to more and more antigens as the child grows, so that not only foods, but clothing material, certain pollens, and even bacteria and fungi are rendered causative in the elicitation and continuation of the cutaneous response. This is the type of eczema with which urticaria, asthma, and so on, are frequently associated. It is noteworthy that this line of research demonstrates that eczema occurring for the first time in adult life is rarely due to food, and the majority of these cases are due to direct contact (exogenous) with chemical or physical antigens, or to specific sensitisation to fungi or bacteria. An entirely new aspect of the problem was contributed by Dr. H. W. Barber (London), whose experiments with Dr. G. H. Oriel's urinary proteose have already been published.[2] If future investigations should confirm their findings, which apply to asthma as well as eczema, and possibly to other dermatoses, such as dermatitis herpetiformis of Dühring, yet another avenue of research which may influence and strengthen our therapeutic endeavours will have been opened up.

Tuberculosis of the Skin.

The subject of tuberculosis of the skin and its treatment, introduced in an excellent paper by Dr. H. W. Adamson (London), inspired the production of many of the official communications and provoked much discussion. Prof. A. Reyn (Copenhagen), Finsen's successor in the realm of actinotherapy, demonstrated superb cosmetic effects in properly treated cases of lupus vulgaris. A novel point on which he insisted was the importance of pressing the local applications of the Finsen lamp. A very short interval only should be allowed to elapse between the sessions, and in his experience it is by no means necessary to wait for the subsidence of a reaction from a previous irradiation. Better and more rapid results have followed a combination of the local treatment with the general arc-light baths. After an apparent cure, which followed in the majority of instances in from 8 to 12 months, a prolonged and careful observation for relapses must always be instituted. The more quickly these could be dealt with, said Prof. Reyn, the better the ultimate result. It was, furthermore, of the utmost importance that all practitioners should be prompt in their diagnosis and refer the patient to the proper quarter before the disease had caused disfigurement. An early lupus patch could easily be excised, and this was sometimes the most satisfactory treatment, and certainly had the great advantage of saving time and eradicating the focus. Other speakers confirmed the desirability of excision in early cases. The results of the salt-free and other dietetic measures had not been at all encouraging in Copenhagen, although Prof. O. Ganz (Heidelberg) reported considerable improvement in the exudative type of case. The gold treatment was, for the most part, also condemned, and the general opinion of X rays was that if they were used at all they should

[1] THE LANCET, August 2nd, 1930, p. 251.

[2] Ibid., p. 231.

be applied with extreme caution and only by those who had seen the serious results of overdosage, among which epithelioma had certainly to be feared.

An important paper was contributed by Bruusgaard (Oslo), who succeeded in demonstrating that quite a large proportion of lupus vulgaris in children had been contracted from cases of open pulmonary tuberculosis in one or other of the parents, the relatives, or the nurse who came in daily contact with the children. Such children always showed some pulmonary or hilus gland infection on careful radioscopy, and he was convinced that it was only very rarely that the disease was contracted by way of the skin or alimentary canal. Whenever children were exposed to the possibility of infection they should be removed to a healthy environment, or such steps taken as would render the chances of such a disaster remote. The observation by Prof. R. Volk (Vienna), that although in some cases the bovine bacillus might be the causal factor in production the greater number of lupus cases were infected with the human variety, was in agreement with the views of most authorities. According to him the clinical picture produced is thus not so much the result of a special virulence as the reaction of the patient's own tissues—i.e., his individual resistance. This picture is neither constant nor fixed, and can very easily be altered by the patient's unaided reactions—or by the injection of substances like tuberculin or sanocrysin—for better or worse. It follows, and this was emphasised by other speakers, that injections of all kinds in lupus vulgaris should never be given without a most careful and exhaustive preliminary examination of all the systems in which tuberculous foci might be lying dormant.

Erythema Multiforme.

Of the shorter communications that by Prof. E. Ramel (Lausanne) was by far the most interesting and important. He has carried his investigations on the ætiology of erythema multiforme a stage further, and it seems probable that the syndrome is yet another manifestation of tuberculosis in the human subject.

The preliminary results of "échelon" or "passage" inoculations of the blood of patients in the acute stages into guinea-pigs was reported by Ramel and discussed at a Congress of French dermatologists in Paris last year, and have also been published in this journal.[3] His claims were substantiated by another investigator, who has repeated his experiments, and who announced his confirmatory results at this Congress. Ramel has now found the tubercle bacillus by guinea-pig inoculation in the blood of 21 patients submitted to the test, and in one of these he has actually succeeded in demonstrating the organism (in films stained by the Ziehl-Nielsen method) *from the lesions themselves.* If this latter procedure can be successfully repeated by other workers the tuberculous origin of erythema multiforme, with its occasional joint and serous cavity complications, will have to be accepted as proven. The rôle of the streptococcus, which has always been regarded as causal, in this country at any rate, will then be relegated to the position of a determining or sensitising factor like sunlight, trauma, or the action of certain drugs in the antipyrin group.

Psoriasis.

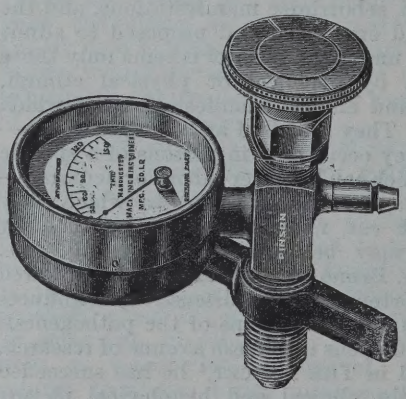
Another interesting communication of a more speculative kind was that submitted by the Dutch dermatologist, Dr. v. Kerckhoff (Leiden), on the ætiology of psoriasis. In a series of histological sections stained by solutions of nitrate of silver he demonstrated the absence, or relative diminution, of melanin and pigment cells in the basal layer of the epidermis. This deficiency was noted not only in the psoriasis patches themselves, but also in the apparently normal skin of such patients. Exposure of the body to sunlight and artificial light was followed by an irregular and patchy pigmentation which demonstrated the loss of function to the unaided eye. Kerckhoff deduces from these and other complex facts that psoriasis is a "light deficiency disease"—a disease in which an inefficient oxidation is an underlying association. Such a theory is further supported by the fact that all the local applications used in treatment are more or less powerful oxidising agents, such as pyrogallol, chrysarobin, and its synthetic standardised, and much more cleanly and powerful substitute, cignolin, which is effective in a concentration as low as 1 per cent. in the average case of the disease.

[3] THE LANCET, 1930, i., 147.

NEW INVENTIONS

AN IMPROVED FINE ADJUSTMENT OXYGEN VALVE.

I HAVE made some improvements in my fine adjustment oxygen valve, particularly with regard to the pressure gauge which indicates the quantity of gas left in the cylinder. The gauge shown in the accompanying illustration has an improved movement which obviates backlash of the pointer, and is also cheaper in production. It is built as an integral part of the valve, which does away with the comparatively expensive union between gauge and valve—a union too, which was rather liable to develop leaks if accidentally knocked or tampered with.



The instrument is manufactured by the Manchester Machine and Instrument Manufacturing Co., Ltd., 2, Booth-street, Manchester.

K. B. PINSON, M.B., Ch.B. Birm.

TUNBRIDGE WELLS JOINT HOSPITAL.—The scheme for a joint hospital on the Culverden site is likely now to come to fruition. An amalgamation between the General and Counties and the Eye and Ear Hospital is considered likely to help both institutions. The original scheme was declared by an advisory committee to be a sound but uneconomic one. The cost was to be £1200 per bed, but the committee found that a modern hospital could be built and equipped for £1000 per bed. Revised plans and estimates have now been presented and for 180 beds—70 more than in the two hospitals at present—the cost will be £180,000. This figure has been approved by the governors who are assured that the reduced cost will in no way sacrifice the permanent efficiency of the new hospital. An appeal to supplement the money already raised for the first scheme is to be launched as soon as the holiday season is over.

REVIEWS AND NOTICES OF BOOKS

The Autonomic Nervous System.

By ALBERT KUNTZ, Ph.D., M.D., Professor of Anatomy in St. Louis University School of Medicine, Missouri. London: Baillière, Tindall and Cox. 1930. Pp. 569. 31*s.* 6*d.*

IN view of the ceaseless output of articles and books concerned with one or other of the numerous aspects of sympathetic activity, physiological and clinical, it is well that the fundamentals of what is coming to be a highly important subdivision of medical science should be set down in a historical framework and at the same time rendered conspicuously clear. The foundation of advance must be anatomical; to postulate functions is meaningless if evidence of anatomical mechanisms whereby they can be carried out is awanting. The student of the subject must go back to the beginning, and there is the more reason for doing so in that the morphology and microscopic anatomy of the involuntary nervous system, so called, have not yet been fully elucidated. He owes a debt of gratitude to Prof. Albert Kuntz for this compact study of essentials, which is distinguished alike by its scholarliness and its reserve.

Adopting Langley's original nomenclature, Prof. Kuntz divides the autonomic system into its components, sympathetic and parasympathetic, and deals seriatim with anatomy (microscopical and general), physiology, and development; thereafter a series of chapters are devoted to the innervation of particular organs (heart, blood-vessels, respiratory system, glands, and so forth, including all the main structures of the body); other chapters handle controversial subjects such as vagotonus and sympathicotonus, the autonomic innervation of striped muscle, and the relation of visceral sensitivity to referred pain. Finally, a sketch is given of diseased states of the system, and of its surgery. This brief conspectus gives the reader some idea of the width of range of the topics to which the author turns his attention, and at the same time must suggest to the instructed mind many points on which information is likely to be wanted. One disadvantage of the work is that the author perforce has to set down more or less dogmatically conclusions which subsequent knowledge may modify, or to draw them from insufficient data. These difficulties Prof. Kuntz has, in our view, met with remarkable skill, for he never fails to indicate in what respects knowledge is incomplete, or to outline conflicts of opinion and evidence and allow the reader to come to heuristic decisions for himself. As a single instance, he declares "it cannot be denied that muscle tonus is influenced directly or indirectly through the sympathetic nerves," yet does not omit to state how inconclusive much of the evidence is, and finally (and, as it seems, correctly) refuses the view assigning a definite (plastic) component of muscle tone to the direct effect of autonomic nerves on muscle-fibres. This fairly represents, we believe, the exact stage to which present information takes us (see THE LANCET, July 19th, p. 127). Again, judgment is suspended in respect of operations on the sympathetic system for relief of visceral pain, yet here also the far-reaching possibilities of the procedures are not ignored.

An extensive bibliography adds to the value of a work worthy of unreserved praise.

Mycoses of the Spleen.

By GEORGE ALEXANDER GIBSON, M.D., F.R.C.P., Physician to the Radcliffe Infirmary and Reader in Morbid Anatomy in the University of Oxford. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1930. Pp. 169. 12*s.* 6*d.*

THIS book is written to prove, in the words of the author, that "we cannot escape the main indication that acholuric jaundice, splenic anæmia, and Banti's disease are infective in origin." Dr. Gibson produces much evidence in support of his thesis that the infecting organism is a mould, but it is not altogether convincing. It rests mainly upon the demonstration, by various staining methods, of structures within spleens removed during life or after death from patients who suffered from the conditions named, these structures being held to be mycelial threads. In many of Dr. Gibson's illustrations the structures do indeed appear very much like fungi; in others the resemblance is not particularly close. If we bear in mind the numerous pitfalls in the interpretation of histological appearances of this kind the evidence supplied seems far from conclusive. The bodies found in the lungs of asbestos workers look extraordinarily like minute crustacea; no one has yet been bold enough to claim that they are crustacea. In the absence of normal controls, the isolation of moulds from 7 out of 37 enlarged spleens is not impressive, and the results of animal experiments give little support to the theory. The author passes lightly over the difficulty of reconciling the hereditary disposition and the microcytosis of acholuric jaundice with the infective hypothesis. It must be remembered, however, that Dr. Gibson speaks with authority; he was one of the first to attribute a mycotic origin to certain types of splenomegaly and has devoted many years to the study of these conditions. Moreover his views have found much support, notably in France, and they are not lightly to be dismissed. The case remains unproven but the avenue requires further careful and unbiased exploration. Chapter XI. containing details of the author's own cases makes heavy reading; the subject matter here included might with advantage have been arranged in tabular form. The book includes a valuable compendium of recent French literature on splenomegaly.

On Faith and Science in Surgery.

By Sir JOHN BLAND-SUTTON, Bart. London: William Heinemann. 1930. Pp. 109. 7*s.* 6*d.*

UNDER this title Sir John Bland-Sutton has republished ten addresses delivered, between the years 1925 and 1930 inclusive, on various occasions when medical or public audiences were gathered together in the metropolis, in large provincial towns in this country, and in the United States and Canada. The various essays, in the course of publication as a collation, have been edited for the purpose and freely embellished with excellent wood engravings. All of them are fairly covered by the title, and provide striking examples of their author's manifold learning and great skill in translating that learning into simple precepts and readable information. Many discoveries and observations made by naturalists have the closest relation to medicine, and in those directions animal psychology and animal inventiveness parody the

activities of mankind, and suggest both texts to the philosopher and therapeutic measures to the doctor. Sir John's olla podrida is a reply to the double suggestiveness. He deals with foods and drugs, and with the sensations of animals that have been swallowed alive; with methods of ligature and with the mentality of conjoined twins; with "attic salt for gall-stones," and the aquatic origin of man; with "the glandular pantheon" and the conquest of sepsis—to pick out a few intriguing titles which will induce readers to consult the little volume. That indeed is the idea of this brief notice, for those who read will be repaid.

Ultra-violet Radiations and their Uses.

By ROBERT AITKEN, M.D., F.R.C.P.E., Lecturer on Diseases of the Skin, Edinburgh University; Assistant Physician in charge, Dermatological Light Department, Royal Infirmary, Edinburgh. London: Oliver and Boyd. 1930. Pp. 208. 10*s.* 6*d.*

Dr. Aitken, who has had 17 years' experience with ultra-violet light as a therapeutic agent, is well qualified to speak authoritatively on the uses and limitations of light treatment. He considers that ultra-violet radiation is valuable in the treatment of many dermatological conditions, such as alopecia, furunculosis, psoriasis, burns, and so forth, and that it is of the greatest use in the treatment of lupus. Dr. Aitken is also a firm believer in the general tonic value of ultra-violet light treatment and in its sedative action on restless patients. He discusses critically the sections of the report of the Medical Research Council (1927–28) which deal with this subject, in view of his own clinical experience and of the report of the Scottish Board of Health for 1926.

The historical and scientific sections of the book add little to our knowledge of the facts on which actinotherapy is based, and it may perhaps be questioned whether a restatement of these facts in an elementary form is justified, in view of the number of elementary text-books on actinotherapy already in existence. The statement that eosin painted on a part renders it more sensitive to light will be queried by other experimenters, since actual injection of this dye into the tissues is usually considered necessary to obtain a sensitising action.

Physiological Principles in Treatment.

Sixth edition. By W. LANGDON BROWN, M.D., F.R.C.P., Physician to St. Bartholomew's Hospital. With the collaboration of R. HILTON, M.B., M.R.C.P. London: Baillière, Tindall and Cox. 1930. Pp. 464. 10*s.* 6*d.*

THE importance of physiology in medicine and particularly in the understanding of essential principles of treatment requires to-day no emphasis. There is still, however, a tendency towards haphazard therapeutics and a lack of appreciation of the fundamental defects which treatment aims at correcting. A realisation of disorders of function must depend upon an accurate knowledge of human physiology. This volume contains a mass of sound advice and wise guidance. The book is comprehensive in scope and is written with such a full appreciation of practical issues as to be a valuable handbook of treatment. In this edition the sections on diabetes, the parathyroids, vitamins, gastric secretion, and the treatment of Graves's disease have been revised, and new work on the ovarian hormones and liver treatment in pernicious anæmia has been incorporated. A large portion of the book is taken up with a consideration of alimentary and metabolic disorders, and we miss any full consideration of anæmia and the uses of blood transfusion, or on the value of such measures as phrenicotomy and artificial pneumothorax. However, the book makes no claim to be a complete review of modern principles of treatment, and the authors are to be congratulated upon the discretion they have shown in the selection of the subject matter. Their book should be in the hands of all who would guide their treatment along rational lines.

Science in Soviet Russia.

By J. G. CROWTHER. London: Williams and Norgate, Ltd. 1930. Pp. 128. 7*s.* 6*d.*

IN a series of interesting chapters Mr. J. G. Crowther who has already shown himself a capable exponent of scientific subjects in simple language, communicates the result of a short visit to Russia where his time was spent in the scientific institutions of Leningrad and Moscow. He acknowledges inability to speak or read Russian, so that the information which he gives, as well as his deductions, are based on communications the accuracy of which he could only check by personal observation. The outcome is a very readable account of what "science" in Russia to-day really implies, with certain well-balanced estimates of what the future may bring forth.

The limitations of the information are obvious. Mr. Crowther writes frankly from the communistic point of view, and admits that in the organisation of scientific work in the Soviet Union definite stress is laid upon the political views of the workers—in other words, those who falter in their allegiance to Soviet dispensation may at any moment find themselves without occupation. What will come of the "integration of science, the State, and the industry of the country"—the phenomenon which we are asked to envisage—may or may not be that world-power which Mr. Crowther regards as possible in 20 years' time, for the accuracy of the forecast must depend upon the conditions under which this union of public interests and individual endeavour takes place. To take as an example of what is meant by "integration" we find a Government department under which certain scientists receive certain salaries to do whole-time work, the result of which will be expressed in terms of pure science or of applied science, as the work can be utilised in industrial directions. It would seem that the outcome of the particular activities must depend for its value primarily on the capacity of the men chosen to do the work, but indirectly upon the security of tenure enjoyed by the workers. Soviet Russia recognises no difference between "pure" science and "applied" science, recognising that all research work demands the same ideals of honesty, accuracy, and pertinacity; but will these ideals be reproduced materially if, to quote the author, "a purging of intellectual institutions takes place" when "'wobblies' have been given the sack."

Every page in this enthusiastic little book suggests that the vast and multiple efforts towards scientific discovery made under the creative urge of modern Russia must bear fruit in directions which imply vast national wealth and the power that will spring therefrom. But every page also suggests that the world is watching a gigantic experiment, and this at a distance from accurate knowledge of conditions which renders thoughtful surmise little better than guessing.

THE LANCET.

LONDON: SATURDAY, AUGUST 23, 1930.

THE HEALTH OF THE CASUAL POOR.

FEW small sections of the community have been o much the subject of investigation and legislation s those individuals who tramp about the country nd seek shelter at night in casual wards. From udor times until the present there has been a ong series of enactments and official inquiries oncerning vagrancy and the reactions of the agrant upon society at large. The last of these fficial investigations was entrusted by the present linister of Health to a Departmental Committee, hose terms of reference were "to inquire into the dministration of the laws relating to the relief f the casual poor, and to make recommendations ith special regard to the assistance of persons eeking work, and to persons suffering from hysical or mental disability"; this Committee, hich began its work at the end of last year, as just issued a report, of which a brief summary ppears on p. 415.

It is worthy of special note that in this latest nquiry the attention of the investigators is specially rawn towards the disabilities of the destitute ayfarer. Hitherto, the health of the tramp, hen it has come up for consideration, has been egarded more from the point of view of the ublic than from his own, and from time to time e has been suspected as a disseminator of disease nd generally as a "nuisance injurious to health." hus, in 1893, and again in 1904, the late Dr. H. E. RMSTRONG, at that time M.O.H. for Newcastle-on-yne, published reports in which he showed the elation of small-pox to vagrancy. Again, at the eginning of 1928 a number of cases of small-pox ropped up among persons in casual wards and ccounted in some measure for the spread of ne disease from district to district. On this ccount and by means of Circular No. 859, boards f guardians were requested by the Ministry of Iealth to instruct their medical officers to examine ll casuals daily. This routine examination was ontinued for nine months during which period ver 100 cases of small-pox among casuals were rought to light. At the same time a general urvey of the physical conditions among casuals as made by the various medical officers, and out f 120 reports received from these officers 80 per ent. testified favourably to the physical well-eing of the casuals examined. Apart from this vidence the Committee at the outset of its nquiry had no sort of statistical data upon which o base further investigations, or form conclusions bout the physical disabilities of casuals; such evidence, however, as was given by the various witnesses during the course of the inquiry generally corroborated that of the medical officers referred to above. The estimates of the proportion of casuals suffering from mental disabilities, as given by witnesses, showed a wide variation; to secure some statistical information on this matter, therefore, the Committee wisely availed itself of the offer by the Board of Control to allow Dr. E. O. LEWIS of that department to undertake a special investigation on their behalf. It will be recalled that in his report, which was published by the Mental Deficiency Committee of 1929, Dr. LEWIS arrived at the somewhat startling conclusion that the mean incidence of mental defect in England and Wales was 7·34 of the population at large. The results obtained on this occasion by Dr. LEWIS from the examination of nearly 600 casuals in various representative institutions throughout the country are equally arresting, and they appear in Appendix III. of the report under consideration. Briefly, it appears that, of 592 casuals examined (including 50 women), 159 showed signs of abnormal mental condition; thus, 15·7 per cent. were classed as feeble-minded, 5·4 per cent. as insane, and 5·7 per cent. as psychoneurotic. All the mental defectives were of the feeble-minded type and no idiots or imbeciles were observed; the majority of those classed as insane were suffering from senile dementia, and several of those in the psychoneurotic group resembled cases of "shell-shock." Stammering, often severe, was frequently observed among members of this last group.

Arguing both from the accepted teaching that the incidence of mental deficiency in any group of persons is a reliable index to the amount of subnormal mentality in the group as a whole, and from his actual observations in the present instance, Dr. LEWIS concludes that the majority of casuals must be considered as persons of subnormal intelligence. If this be so it would help to explain in some measure perhaps the social inefficiency which characterises so many of the vagrant class. Several other interesting and significant observations were made about the physical condition of casuals examined during this special inquiry. Thus, the group of casuals as a whole was found to be surprisingly free from respiratory disease, and only one definite case of advanced phthisis was found; chronic alcoholism was diagnosed in no less than 75 cases; skin diseases were very rare, and as an indication of general bodily cleanliness it is recorded that, despite diligent search, only one case of scabies was found, and only very few casuals showed marks of flea-bites. From a consideration of the figures for height and weight and from other circumstances, Dr. LEWIS concludes that the nutritional condition of the casuals examined was not materially inferior to that of the general population. The total number of cases which Dr. LEWIS was able to examine in the time available is small, but his results as regards the mental conditions of casuals certainly justify the Departmental Committee in recommending, as they have, that there should be periodical inspection of casuals both by the medical officers of the

institutions to which they resort and by specialist medical officers of mental deficiency authorities. The thought that, as Dr. LEWIS computes, some 1800 mental defectives—apart from others of unstable mind—are roaming the country as destitute wayfarers is disturbing and warrants the hope that arrangements for medical examination such as the Committee recommends may be instituted without delay. On the other hand, Dr. LEWIS'S observations on the bodily cleanliness, skin state, and nutritional condition of casuals are more reassuring and would seem to imply that in many casual wards, at any rate, the measures designed and carried out for the personal hygiene and bodily comfort of the casual poor have not fallen far short of the standards which the Committee would like to see generally adopted.

The report of the Committee appears opportunely, at a time when the administrative care of destitute persons has passed to new and larger authorities, armed with greater powers than had their predecessors for carrying out such medical recommendations of the Committee as may be subsequently endorsed by the Minister of Health.

MEDICAL TREATMENT OF CANCER.

DELAY in the diagnosis of malignant growths or their occurrence in such inaccessible situations that no radical cure may reasonably be expected from surgery, X rays or radium, involves the patient in a situation generally so hopeless that no systematic plan of treatment can be undertaken apart from the relief of physical suffering by sedatives. The prevailing atmosphere of gloom appears to induce in physicians a paralysis of effort which is both unreasonable and discreditable, for although it may be true that little can yet be done in the way of specific treatment for advanced malignant disease a great deal can be done for the victims of it. The paper by Dr. A. T. TODD in our present issue is a notable contribution to this neglected aspect of practice, and it is rendered particularly interesting by reason of his conviction of the value of lead selenide in the treatment of cancer. The introduction of the treatment of malignant disease by intravenous injections of colloidal lead by Prof. BLAIR BELL and his colleagues at Liverpool was first announced in 1922; but in view of the toxicity of the remedy it seemed wise to the Liverpool workers to delay publication of the methods by which their remedy was prepared and subsequently to restrict its general supply for a time. The thorough investigation of the potentialities of lead did not, therefore, take place for some time, and even then the disastrous results of the indiscreet use of the method obscured the important clinical fact that occasionally very remarkable benefit followed its employment. It is now clear from the work of TODD in Bristol and of THOMSON and SANDERS in Birmingham that occasionally in the treatment of advanced malignant disease various compounds of lead in suitable doses may produce definite improvement without subjecting the patient to the risk of the rapid deterioration of his general physical condition that sometimes followed the use of very large doses. In Birmingham and in Bristol the tentative conclusion has been reached that lead acts indirectly by stimulating some general resistance to malignant disease and, on this assumption, as Dr. TODD emphasises in his paper, it is desirable to employ any additional measures that could conceivably assist the process.

The evidence for the existence of such general resistance to invasion by malignant growth is drawn chiefly from clinical observation. Any careful observer must be impressed with the unequal progress of some fatal cases of cancer; for long periods all activity of the growth may appear to be suspended, and the patient's condition remains stationary until in a comparatively short time the disease makes serious headway. Alternating phases of this kind are by no means uncommon and it is difficult to explain them on any other basis than that of a waxing and waning of general resistance. There is further the fact, with which radiologists are familiar, that sometimes exposure of one superficial metastasis of growth to X rays is followed within a few days by definite regression of other metastases which have been shielded from the direct effect of the rays; this suggests the possibility that absorption of the necrotic products of radiation has induced a systemic reaction to the disease. Finally, there are the few but indubitable instances of spontaneous recovery from malignant disease.

The nature of the factors underlying these clinical phenomena remains obscure, but that is no reason why physicians should not attempt to influence them favourably; such work has a value beyond the relief obtained in individual cases, for in a discouraging field it serves to keep alive that spirit of independent clinical inquiry which is the essence of medicine. Dr. TODD makes few claims. The group of workers under his guidance have not expected to cure the patients accepted for treatment, since these were advanced inoperable cases chosen only on certification that nothing could be done for them, though they were not actually moribund. The aim was to demonstrate the utility or otherwise of lead selenide in producing relief of pain, euphoria of the patient, and regression of the cancer. Only after a technique had been evolved was it hoped to apply the method to earlier cases, with less widespread growth, and therefore some hope of survival. Dr. TODD for these reasons offers no statistics, but he proceeds to describe the preparation used, the dosage in different types of cancer, the remedial effects observed in experimental animals and in man, and, finally, outlines the case for devising a technique for concurrent radiation and lead selenide therapy. Additional measures—the administration of calcium chloride, the fat-soluble vitamins in large doses, thyroid extract in small doses and liver extract—are also used in his wards and since it is not certain how much the interaction of these various medicaments conduces to the results obtained, he advises that none of

them should be omitted. He commends his methods to surgeons for trial (1) after recovery from irradiation, (2) after the removal of as much of the growth as possible in inoperable cases, (3) after operations regarded as complete, in case complete removal has not been achieved.

LOCAL REST IN PULMONARY TUBERCULOSIS.

THE basis of the modern treatment of all forms of tuberculosis is rest. The pharmacopœia has provided a few palliatives for some of the more distressing symptoms of the disease but has failed to supply any drug having the slightest influence on the course of the malady. The laboratory has supplied a series of vaccines, some dangerous, some at least innocuous. If collapse therapy is able to boast of occasional successes where all other forms of treatment can only record failures, it is because by its means the tuberculous lung is set at rest. Were diagnosis always made at the onset when the disease is usually limited to a small area of one lung and were the pleura less liable to the formation of adhesions, the treatment of pulmonary tuberculosis would be a simple matter. Unhappily a completely successful artificial pneumothorax is the exception rather than the rule. In some cases adhesions are already present as the result of old pleurisy before the lung parenchyma is attacked, in others they are due to localised pleurisy over recent disease. In either case they prevent the complete collapse of the lung. Sometimes partial collapse may suffice to abolish symptoms and to banish tubercle bacilli from the sputum. More commonly, however, the healthy parts of the lung alone retract, while cavities remain gaping owing to the bands which tether the diseased areas to the parietes, tubercle bacilli are still expectorated, and sooner or later there is inhalation spread in the opposite lung.

If artificial pneumothorax fails, surgical methods offer the only means of attaining pulmonary collapse. The surgical methods include: (1) Internal pneumolysis: the severance of adhesions by cautery or diathermy cutting current under endoscopic control. (2) External pneumolysis: the separation of the parietal pleura from the chest wall over the diseased area and packing of the space thus formed by paraffin, fat, or muscle. (3) Phrenic avulsion: the removal of the phrenic nerve by traction through a small cervical incision. (4) Thoracoplasty: the removal of segments of some or all of the fixed ribs from one side of the chest so as to allow the chest wall to sink in. The results of the cauterisation of adhesions in suitable cases are excellent, as witness recent papers[1] in our own columns by G. MAURER and F. G. CHANDLER. But all cases are not suitable for this treatment; the thoracoscope can only be used when there is a pleural space and general adhesions may prevent its employment. External pneumolysis seldom gives satisfactory results. The minor operation of phrenic avulsion and the major operation of thoracoplasty are those most commonly employed. The type of case most suitable for thoracoplasty is the fibrocaseous, unilateral and comparatively inactive, where an adherent pleura prevents or nullifies the benefit of artificial pneumothorax. The general resistance must be good. The patient's mentality must be hopeful and the social circumstances not unfavourable. The operation is a severe one and the general consensus of opinion is that it should be done in at least two stages. The disadvantages of two or more operations instead of one—and the disadvantage from the patient's point of view is a grave one—are held to be outbalanced by the lessening of shock and the avoidance of too sudden a strain on the contralateral lung. The results of thoracoplasty are difficult to assess. If cases are rigorously selected, if operation is limited to the more chronic types of unilateral disease, the results are good. But it is not easy to say what the later history of many of the cases would have been without operation. Many patients suffering from chronic fibroid phthisis remain for indefinite periods in fair health and activity without any special treatment. Artificial pneumothorax achieves its most dramatic successes in the acute febrile types of disease; thoracoplasty can only be offered to patients who are afebrile and in no immediate danger. Nevertheless the results claimed for thoracoplasty are impressive. Thus BÉRARD and DUMAREST,[2] in a series of 98 cases operated on before January, 1929, obtained amelioration of symptoms in 7·1 per cent., good results in 18·3 per cent., and very good results in 22·3 per cent. Since 1925 no patient has died in their clinic as the result of the operation.

Though phrenicotomy is a far less effective means of securing lung collapse it is a much less drastic procedure and it is more widely applicable. Fever does not contra-indicate its employment. The patient's resistance need not be good, for the operation entails as a rule no shock. Its value is not referable to the pulmonary base alone, for, as BÉRARD points out, a partial immobilisation of the whole organ is obtained. Phrenic avulsion should always be practised as a preliminary to thoracoplasty, it may render an apicolysis or partial thoracoplasty more efficient, and may even bring some relief to a contralateral lung which is attacked by disease after its fellow has been put at rest by surgical interference.

[1] THE LANCET, July 12th, pp. 72 and 74.

[2] Arch. méd.-chir. de l'appareil resp., 1929, iv., 498.

HOSPITAL SATURDAY FUND.—The fifty-seventh annual appeal will be made by this Fund on Saturday, Sept. 27th, which will be its flag day. Last year £83,000 was distributed among hospitals and allied institutions by the Fund.

CHARING CROSS HOSPITAL.—Last year 4160 in-patients were admitted and stayed on an average 21 days, costing £11 17*s.* 6*d.* each. The 28,146 new out-patients included 18,881 casualties; their average cost was 7*s.* 5*d.* Improvements have been carried out at a cost of £100,000, all of which has been obtained, and on an expenditure of £57,261 there was a credit balance of £1688.

ANNOTATIONS

THE PARENTAL STATE AND IMPERSONAL MEDICINE.

ADDRESSING the Ottawa Canadian Club on the theme of medicine and statesmanship last week Lord Dawson of Penn sounded a note of warning to which both the statesman and the doctor of to-day may well listen. He pointed out that the doctor of the old school thought of the sick person as a human being who, for the time being, was separated by inexplicable illness from the stream of life, and thus the doctor himself tended to become cloistered—separate in thought from the body politic. In modern times the wider appreciation of the value of preventive medicine, in response to its wider applications, had brought with it a more intimate contact on the part of the doctor with the daily life of the people, and not only of those people who are laid aside by sickness, but also of those who are enjoying health and strength. Alongside this development in medicine, Lord Dawson pointed out, there had been a similar movement in statecraft, for after the various struggles of the people for liberty and self-government the State had acquired a parental function expressed in the help provided for those who were helpless through their infancy, their ignorance, their want, or their unemployment.

The State to-day regulates wages and hours of labour, as well as cares for its weaker members, and is prompted to all this parental action by a social conscience, and in tracing out the lines of development of this function Lord Dawson forecast certain results. There was, he thought, no attribute of the human being more notable than his individuality. "Parade a thousand men and each would be found to be distinct—even to his finger-prints." By long exercise of his intuitive mind the doctor has to take cognisance of this personal factor; is not personality of equal importance to the statesman? Here the speaker pointed to the danger that might follow on the State being compelled to consider the individual "so standardised as to be hypothetical rather than real." This is a shrewd warning to many publicists to-day, who in their honest desire to see that an equality of opportunities should offer itself to the largest possible number of citizens are apt to forget that the best work will always be done when the incentive of individual stimulus is present. Attempts to standardise the human being in medicine have never been a success. Even the laboratory tests of normal function have not been conspicuously successful—the individual too often eludes the common test. Prof. Julian Huxley, in one of his earlier writings, remarked that "the essential quality of an individual is not life but individuality," and it is not a tautological platitude but a truth of physiological importance. In the sphere of practical medicine there is surely a grave danger lest the assumption should be made among those who are in social authority that all those reactions of the human personality which we call illness can be docketed on an official form and dealt with by an administrative office. No one takes this view in respect of acute emergency, but too many persons are prepared to think along these lines in branches of our science that are equally, if not more generally, important. No scientific man, and, of course, no doctor, is in danger of assuming that a series of specialist officers, in whatever profession they may be expert, could watch over and protect human destinies, but Lord Dawson's view that the State should be ready to take specialist advice on the advisability of social departures is sound, now that the business of Imperial Parliamen is so diffuse and necessarily so influenced by party considerations.

THE BLOOD BILIRUBIN IN "APOPLEXY."

THE diagnosis between cerebral thrombosis and cerebral hæmorrhage is not always such a simple matter as the text-books would have us believe Thrombosis sometimes occurs with startling sudden ness and the onset of symptoms following hæmorrhage may be quite gradual. Since the treatment of the two conditions is in many respects opposite and prognosis also differs fundamentally the distinction is one of extreme importance. Hence any assistance in the differentiation of the conditions that would supplement the results of clinical examination would be welcomed. Dr. G. Cheney [1] has recorded observations on the amount of bilirubin in the blood after "apoplexy" in a number of patients suffering from cerebro-vascular accidents. After extravasation of blood into a closed space the blood-pigment is gradually absorbed from the affected area and taken up in the blood stream. There is thus an increase for a time in the amount of blood-pigment circulating in the blood. Clearly after a cerebral thrombosis with subsequent softening of brain tissue no such absorption of blood-pigment should occur, at least to any marked degree. Dr. Cheney has followed up the original study of J. Wilder [2] in Vienna upon this assumption. In Wilder's cases the serum bilirubin was found to be definitely increased in the majority of patients suffering from cerebral hæmorrhage and he concluded that one could determine in this way with great probability whether an "apoplexy" was due to thrombosis or hæmorrhage. Dr. Cheney reports his own series of 50 cases in which the blood bilirubin was estimated from one day to three months after the attack; in only five of them, however, was post-mortem confirmation of the diagnosis possible. The icterus index, which is a simple colorimetric estimation of the quality of bilirubin in the serum, and the van den Bergh reaction were determined in all the cases. Of the 32 patients described, 17 showed blood bilirubin above the normal; only three of them came to autopsy, and of these one showed a large subdural hæmorrhage due to trauma and the remaining two multiple small brain hæmorrhages due to uræmia. Dr. Cheney concluded that nine of the others showed some evidence of hæmorrhage; but this observation has little value in view of the fact that of the 15 who showed normal or borderline bilirubin values, at least five were probably hæmorrhage. The van den Bergh reaction was also carried out in all these patients since a direct positive result, indicating biliary tract disorder, obviously obscures any changes due to hæmatogenous causes. Cheney's results, therefore, do not confirm the hope that the determination of the serum bilirubin is a method capable of indicating consistently the presence of cerebral hæmorrhage as against a cerebral thrombosis; on the other hand a definite increase in the serum bilirubin (without a positive direct van den Bergh reaction) after cerebro-vascular accident indicates the probability of a hæmorrhage. It is an interesting circumstance

[1] Cheney, G.: Amer. Jour. Med. Sci., July, 1930, p. 24.
[2] Wilder, J.: Wien. Klin. Woch., 1927, xl., 1158.

that in Cheney's series there was no constant relationship between blood-pressure readings and the type of cerebral lesions; thus many cases of high blood pressure were thought to have suffered from thrombosis, and several patients with quite low pressures were diagnosed after careful observation as cases of cerebral hæmorrhage.

WILLIAM BEAUMONT AND THE GASTRIC JUICE.

EVERY medical student has heard of the accidental wounding of Alexis St. Martin at Fort Mackinac, on Lake Huron in June, 1822, when a part of his stomach wall and of his left lung were carried away; of his recovery after a protracted convalescence even in the pre-antiseptic days, and of his resultant gastric fistula by which Dr. William Beaumont, the regimental surgeon stationed at the Fort, was enabled to carry out numerous investigations. The results of these were published 11 years later by Beaumont at Plattsburgh (F. P. Allen), and no historical summary on digestion is complete without reference to what is now considered a medical classic. Owing to the rarity of the original editions readers, however, have had to rely upon the accuracy of abstracts of this work by other authors, unless they were fortunate enough to have access to the original work. The Harvard University Press have now brought out a facsimile[1] of the 1833 edition, thus bringing within reach of all medical men this outstanding work of Beaumont. The volume is enhanced in value by the inclusion, as a preface, of a reprint of Osler's address on Beaumont delivered before the St. Louis Medical Society on Oct. 4th, 1902. Osler sketches the life of Beaumont in the United States Army, and traces the career of St. Martin until his death at the age of 75. We are told of his horror of further experiments, of his somewhat ungracious refusal to accede to Beaumont's last plea, in a letter dated Oct. 15th, 1852, to return to him in the interest of medical science, and of the manner in which St. Martin's relatives foiled the attempt to obtain an autopsy. Beaumont's life may be read in a careful and sympathetic study published by Dr. J. S. Myer in 1912, to which Osler again contributed an introduction.[2]

Owing to the uniqueness of Beaumont's experiments too great credit no doubt has often been paid to the results of his researches, and too little to those of his predecessors. Before Beaumont had written, the reaction of the gastric contents before, during, and after digestion had been noted by Carminati and Reaumur, the nature of the acid secreted was determined by Prout and confirmed in England by Children and in Germany by Tiedmann and Gmelin, and an accurate description of the gastric juice had been given by Brugnatelli and Scopoli. It is of interest to note that Berzelius, the famous chemist at Stockholm, was unable to detect any acid in the specimen of gastric contents sent him by Beaumont. Gosse, who could vomit at will, had already determined with an amazing degree of accuracy the digestibility of various foodstuffs, and subdivided animal and vegetable foods each into three classes, according as the stomach could digest them. Beaumont's observations are, however, outstanding in the care and diligence with which he pursued his work. He initiated a completely new advance in gastric physiology. His method of obtaining gastric juice was a distinct advance over the previous attempts such as killing animals, the use of sponges rejected from the stomach, and the employment of voluntary vomiters. The accidental production of a gastric fistula was quickly followed by its experimental production in animals, finally reaching perfection in the Pavlov pouch.

Beaumont anticipated many of Pavlov's results including the influence on gastric secretion of mental disturbances, the relation of the amount of food taken, and the quantity of juice secreted, and the condition of the fasting stomach. He was, however, wrong in supposing that gastric juice could be secreted through the reflex of direct stimulation of the mucous lining of the stomach.

[1] Experiments and Observations on the Gastric Juice. Facsimile edition, 1929. By William Beaumont, M.D., Surgeon in the United States Army. Cambridge: Harvard University Press. 1929. Pp. 247. 12*s.* 6*d.*

[2] See THE LANCET, 1913, i., 704.

X RAYS IN FILARIASIS.

THE attention drawn by Dr. M. Weinbren[1] to the possible value of X rays in the diagnosis of *Cysticercus cellulosæ* and *Trichinella spiralis* renders opportune a reference to the likelihood of their increased uses in filariasis as suggested by work of F. W. O'Connor, Ross Golden, and Hugh Auchincloss.[2] These writers recall the observations of others that *Filaria bancrofti* may be present, particularly in groin and epitrochlear glands, in large numbers both alive and more or less calcified. On several occasions O'Connor has laid stress on the presence of a small painful area in the distal part of a limb, the pain increasing in intensity with an attack of lymphangitis or elephantoid fever, which was believed to be filarial in origin. He further found that on excision of the skin and subcutaneous tissue comprising such an area in a lymphangitic patient adult filariæ were present in the subcutaneous fat of the excised portion, which, of course, contained no lymphatic glands. After excision symptoms disappeared, and had not returned during a year's observation. It was also noted that in a piece of excised subcutaneous tissue living and calcified worms were frequently found associated, so that the question arose whether the detection by X rays of calcified worms might not be a guide to the situation of living ones. A spermatic cord removed at post-mortem examination was subjected to X rays because microfilariæ were present in the associated hydrocele. Shadows were present in the cord, and were shown to correspond to calcified worms. The way was thus opened for clinical investigation on a woman of 30 who had had attacks of elephantoid fever for 20 years, and in whom elephantiasis was established. She had a tender area on the inner side of the left thigh about 4 in. above the femoral condyle. In this region X rays showed three shadows, each 3–4 mm. long by 1 mm. broad. One lay in Hunter's canal and the other two close together in the subcutaneous tissue on the site of focal tenderness. The skin and subcutaneous tissue comprising this area were excised; as were two other blocks of tissue, one on the front of each leg which had shown local tenderness but no shadows. The results of microscopic examination of part of the tissue from the thigh are reported. Calcified worms were found 1 cm. below the surface, encapsuled in concentrically arranged fibrous tissue; the inner aspect of this capsule showed no evidence of endothelial cells, while the connective tissue round it contained numerous engorged blood-vessels with greatly thickened middle coats. There was no local eosinophilia, nor had previous blood examination detected either blood eosinophilia or microfilariæ.

[1] THE LANCET, 1930, i., 1433.

[2] Amer. Jour. Rontgenol. and Radium Therapy, 1930, xxiii., 494.

Apparently none of the filariæ were alive when excised; at least there is mention only of partly calcified specimens, though this change was not in all cases extensive enough to throw a detectable X ray shadow. In some other cases of elephantiasis reported upon, shadows corresponding to those thrown by calcified filariæ were found in considerable chains. It is clear, then, that numbers of *F. bancrofti* may lie scattered in the subcutaneous tissue or strung out in distal lymphatic vessels. It is also pointed out that even extensively calcified specimens are hard to detect unless the limb has been so arranged that they lie in its profile. Nevertheless, the belief is expressed in the paper that since excision from an elephantoid limb of areas containing living worms has improved symptoms, the X ray demonstration of calcified filariæ may aid in localising the attack on the disease.

AN OFFICIAL CORRECTION FROM THE M.R.C.

PENDING a reply from their American house the Sandoz Chemical Works, Pharmaceutical Department (5, Wigmore-street, London, W. 1), desire us to publish the following extract from the *Pharmaceutical Journal* of Feb. 20th, 1926 :—

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN: THE PHARMACOLOGICAL LABORATORIES.

(Text of a pamphlet which is being supplied to inquirers by the Secretary of the Society, 17, Bloomsbury-square, London, W.C. 1.)

These laboratories are now in a position to test the drugs and preparations dealt with in detail hereafter.

3. *Ergot.*—Samples of ergot will be accepted to be tested in the form of the powdered ergot. The Geneva Conference has made no recommendations in the matter of ergot. The chief active substances which may be present in extracts are ergotamine (or ergotoxin), histamine, and tyramine. It will be assumed that the therapeutically active substance is the specific alkaloid ergotamine, and a test for its amount will be applied to an acid alcoholic extract of the powdered drug.

As standard a sample of ergotamine tartrate is available, prepared by the Sandoz Chemical Works, Basle.

The test applied will be the capacity of an acid alcoholic extract prepared from the sample to reverse the action of adrenaline either on the blood pressure of a pithed cat or on the isolated uterus of the rabbit. After consultation with the Director of the Department of Biological Standards, Medical Research Council, it has been decided to approve as good samples of ergot those containing not less than 1 mgm. per gram of the specific alkaloid.

INSULIN IN OIL.

IN the treatment of diabetes mellitus the ideal towards which the physician strives is to keep the blood-sugar of the patient within normal limits throughout the 24 hours. The attainment of this ideal is often prevented because insulin, as usually administered in aqueous solution, is completely absorbed within eight hours of injection. Several attempts have been made to overcome this difficulty by incorporating insulin with some vehicle which will delay the absorption of the hormone. Some 18 months ago Dr. O Leyton described in these columns[1] some experiments with a suspension of powdered insulin in castor oil, in the proportion of 100 units to each cubic centimetre. He found that the period of absorption was increased to as much as 16 hours and that correspondingly large doses of insulin could be administered in this way without provoking hypoglycæmic symptoms. More recently, M. Labbé, R. Boulin, and H. Goulié have worked on the same lines using olive oil containing 20 units of insulin per cubic centimetre. They examined[2] the blood-sugar curve after 20 units of this suspensic and after the same dose of aqueous insulin, but fou little difference between the two curves. They a observed that in diabetics on a fixed diet the glycosu increased when the oily preparation was substitut in similar doses for ordinary insulin. They conclu that oily suspensions of insulin do not retard abso tion. The results of most other workers, howev tend to support Leyton's opposite conclusic although there is no general agreement concerning t degree of delay which can be obtained. Apart fr this question the use of oil as a medium for su cutaneous injections is not entirely free from objectic Vegetable oils such as castor oil do not usually exc any notable inflammatory reaction in the surroundi tissues, but it is often a matter of weeks before t oil is completely absorbed—an obvious objection circumstances where repeated injections are necessa

[1] THE LANCET, 1929, i., 756.
[2] Bull. et. mém. de la soc. méd. des hôp. de Paris, July 7th, p. 1190.

MILK FEVER.

THE last of this year's Goulstonian lectures[1] the significance to clinical medicine of studies calcium and phosphorus metabolism was concern partly with the contribution to therapeutics of t researches which Dr. Donald Hunter had describ The use of calcium therapy in tetany, lead poisoni œdema, and acute necroses of the liver was discuss with reference to human patients, and a brief co cluding section noted the work of Prof. H. Drye and Prof. J. R. Greig[2 3] on the milk fever of co At the International Veterinary Congress, held London from August 5th to 9th, Prof. Greig gave historical account of the steps whereby the ætiolo of this curious condition has been elucidated.

Milk fever is a disease of sudden onset which attac milk cows, producing partial or complete prostrati and paralysis of the hind quarters, sometimes a of other parts. Primiparæ are rarely affected. T period of greatest susceptibility in the milking l of an individual cow corresponds to the period f greatest milk secretion. Many hypotheses have fr time to time been formulated to explain the natu of milk fever. On the theory that the cause was infection J. J. Schmidt in 1897 injected into t udders of a series of cases a solution of iodide f potassium, which was at that time believed to ha antiseptic properties. The treatment met w remarkable success, and reduced the mortality fr the disease from 60 or 70 per cent. to 15 per ce Later a modification, devised by Andersen (Skand borg) and others, replaced the injection of flu by mammary inflation, and to-day the mortal is less than 1 per cent. But while a specific c for the disease had been discovered empirically, t cause of milk fever remained a mystery until, 1924, Prof. Dryerre and Prof. Greig began to inve gate the pathology of the condition, starting w the fact that specific cure resulted, no matter whet antiseptic fluids, sterile water, oxygen or air w injected into the udder. They decided that sim distension of the mammæ must act either (1) eliciting some endocrine disturbance, or (2) mechanically retarding or arresting milk secreti and so preventing the loss in the milk of some su stance vital to the organism. It occurred to th that the colostrum of the cow is rich in calciu and that the onset of a profuse lactation mig occasion a rapid reduction in the concentration the blood calcium. This idea seemed to be support

[1] THE LANCET, 1930, i., 526, 897, 947, 999.
[2] Vet. Record, 1925, v., 225; 1928, viii., 721.
[3] Greig, J. R.: Vet. Rec., 1929, ix., 509; 1930, x., 115.

by the further observation that the spastic seizures in the early stages of milk fever were often tetanic in character. Since not every heavy milking cow was subject to the disease some other factor, such as parathyroid dysfunction, was postulated as a predisposing cause.

The story of the gradual confirmation by experimental evidence of this main hypothesis and the disposal of other theories that at one time looked equally probable is a fascinating one. While the blood calcium content of normal parturient or lactating cows is 9 mg. to 11 mg. per 100 c.cm. serum, that of 82 cows attacked by milk fever was found to give an average value of 5·13 mg. The degree of the severity of the symptoms, moreover, bore a distinct relation to the calcium level in the blood, while the blood-calcium concentration in bovine diseases other than milk fever was normal or only slightly below normal. Inflation of the mammæ of normal lactating ewes was found to cause a rise in the blood calcium of about 10 per cent., and finally in 15 cases of milk fever successfully treated by mammary inflation this procedure invariably caused a rise in the blood-calcium value. In Prof. Greig's view the curative effect of mammary inflation may be due to its mechanical effect in preventing the further interchange of calcium from the blood to the gland acini, and also to the forcing back of the calcium, which is heavily concentrated in the gland, back into the blood. This method of treatment, however, is now likely to be superseded by direct calcium therapy. In 1928, when seeking for a bland form of calcium which could be injected without producing local irritation, Prof. Greig found that calcium gluconate (Sandoz) produced little or no irritation even when injected subcutaneously. In a series of over 100 cases of milk fever the great majority have been rapidly and completely cured with a single injection of this preparation, and in only three cases did it fail to produce a markedly beneficial response; in these the technique is blamed. It has also been found possible to abort a commencing attack of milk fever by flooding the blood with calcium upon the first appearance of the symptoms. Observations suggest that the disease may be prevented by commencing a massive administration of vitamin D a few days before calving. The fact that not only milk fever in cows, but lambing sickness in ewes, and transit tetany in mares are all rapidly cured by mammary inflation, and that these are the only conditions, in an examination of over 500 samples of blood, in which an acute hypocalcæmia has been found, suggests strongly that the essential cause of milk fever is an acute blood-calcium deficiency, and that the specific curative action of mammary inflation consists in raising the blood-calcium values.

UNIFORMITY IN RECORDS OF MATERNAL DEATHS.

THE world-wide effort to reduce maternal deaths associated with childbearing suggests that a uniform system of classifying such deaths ought to be devised. British obstetricians have recently drawn attention to the lesser mortality in Scandinavian countries and in Holland when compared with that of England, but we cannot be sure that we are comparing like with like. Even England and Scotland classify these deaths on different methods, so that not even English and Scottish towns can be compared. In the annual reports of medical officers of health noticed on another page it is shown that Derby has a maternal death-rate of 3·7, or of 6·3 per 1000 births, according to the system of classification adopted, and the report from Liverpool points out that the inclusion of 21 additional deaths associated with childbirth would raise that city's rate from 3·5 to 4·6. The Edinburgh figure of 7·0 cannot be taken as comparable with the Liverpool figures. An obvious anomaly in the official method of calculating this death-rate is that although the deaths include those from sepsis and other complications following abortions and stillbirths, the rate is calculated per 1000 live births, instead of per 1000 of all terminated pregnancies. Stillbirths are now registered, but the number of abortions is not known. The figure for all terminated pregnancies is, therefore, not available. It would be possible, however, to keep separate the deaths due to abortion, and in view of the increasing number of these deaths this course appears to be desirable. It is, we believe, already practised in many towns and districts in Germany, and in the departmental committee's report on maternal mortality and morbidity recently summarised in our columns the distinction is made in many of the tables compiled. Excluding the deaths from abortion, it would seem proper practice to record the number of these maternal deaths per 1000 live and stillbirths. The main difficulty appears to be the decision which deaths should be recorded as due to childbirth and which as merely associated with childbirth. It ought to be possible to find a way to state the facts so that maternal mortality of various countries and districts can be compared, and a scheme to this end might well be compiled by some interested body, for example by the Health Committee of the League of Nations.

LONDON COUNTY CORONERSHIP CHANGES.

THE retirement of Sir Walter Schröder and Mr. H. R. Oswald from their coronerships at the end of October will end the public service of two officers who have set a high standard of ability and judicial temper. Sir Walter Schröder had many years of experience as deputy before he was appointed coroner for the central district of the County of London 20 years ago. Past president, and now honorary secretary, of the Coroners' Society, he was at one time in charge of the recent edition of "Jervis on Coroners"; many of the notes in that invaluable book are believed to incorporate his opinions. Mr. Oswald's service, almost as long, is not less distinguished; appointed as coroner for the western district in 1919, he had been coroner for the south-eastern district since 1902. The London County Council has expressed its warm appreciation of the admirable work of these two officers; with this expression all concerned will wish to be cordially associated.

These two retirements are of more than personal interest. The London County Council will now be able to reach a further stage in its reorganisation of coroners' districts. The Act of 1926 abolished franchise coronerships (except the offices of the King's coroner, the coroner of the King's Household, the coroner for the City of London, and the coroner for the Isles of Scilly) as from the next vacancy. Within the County of London the dean and chapter of Westminster have their own coroner who, on their appointment, has been coroner for the city and liberty of Westminster. The Duchy of Lancaster has franchise coronerships in London also, the possessions of the Duchy being by no means limited to the north of England but ranging as wide as the former properties of the great John of Gaunt. The Chancellor of the Duchy can, under the 1926 Act,

relinquish his right of appointment by deed under his hand and seal on His Majesty's behalf. Gradually these franchise coronerships will disappear and the programme of regrouping the London districts will proceed. The London coronerships, becoming whole-time offices with systematic superannuation and compulsory retirement arrangements, will continue to be posts of great importance. As the vacancies are filled it will be possible to see what further requirements are stipulated for by the London County Council beyond the statutory qualification (five years' standing as barrister, solicitor, or legally qualified medical practitioner) laid down in Section 1 of the Act of 1926. A coroner with medical qualifications often possesses the additional legal qualification (perhaps less laboriously attained) of having been called to the Bar. It would not be unreasonable to insist that a barrister or solicitor, before being accepted for appointment as coroner for a London district, should also be able to produce evidence of medical knowledge.

FRENCH MENTAL HOSPITALS.

THE study tours organised by the Royal Medico-Psychological Association are proving of the greatest interest and educational value to those privileged to participate in them. Dr. A. E. Evans has once more benefited the less fortunate majority by writing a description of the latest tour to the department of the Seine.[1] The French Lunacy Act of 1838 provides for admission to asylums voluntarily, on request signed by some relative or friend, and by certificate, signed by a doctor. As the cost falls on the departments and townships, some counties only accept as voluntary patients those who can defray the cost. The certificate applies particularly to dangerous cases and the reception order is made by the Prefect of Police. The patients then go to the admission department of L'Asile Ste. Anne, where a new certificate is made out by the senior physician, and thence to the appropriate institution, where the patients are again certified, a certificate recommending detention being supplied 15 days later. Reports are sent to the Procureur (the public prosecutor) every month, and he visits the patients every six months. Discharge is proposed by the senior physician and authorised by the Prefect of Police. Voluntary patients can leave forthwith on the petition of the person who requested admission or on a certificate of recovery from the senior physician. At the hospital of Henri Rouselle patients enter and leave freely without any legal formality. For children there is a dispensary which functions as a hospital. The recovery-rate for the asylums of the department is 45·6 per cent. and the death-rate 12·3 per cent. for the year 1927.

Dr. Evans describes visits to L'Asile Ste. Anne, the Hôpital Henri Rouselle, L'Asile de Villejuif, Maison Blanche, and L'Asile de Vauclose. The Paris centre for mental prophylaxis consists of a central dispensary for examination, classification, and treatment; a mental hospital for observation and treatment; a social service to follow up cases; a department for home visitation by specially trained assistants; laboratories; an institute of psychiatry and a school of mental prophylaxis for training workers. The International Congress of Mental Hygiene was meeting in Paris at the time of the visit. Among the papers read was one putting forward proposals for the improvement of psychiatry in France. It was suggested that the State should coördinate and contr all activities, and that an advisory national coun for mental prophylaxis and a national institute f training and research should be formed. Ea department would have a centre, on the lines of t one existing in Paris, to include a hospital for dangero patients and another for harmless, long-standing, a curable cases; a hospice or colony run on open-do principles for the incurable and feeble-minded; home for patients who need segregation; a speci establishment for antisocial or criminal patient and facilities for research and the teaching of ment prophylaxis. Home treatment with money paymen would be provided for and particular attention giv to the selection of suitable employment. The pr posals also suggest that the dispensaries should ha advisory functions relating to eugenics, delinquenc prostitution, vagrancy, and immigration.

Occupational therapy, which was such a feature the Dutch mental hospitals visited in 1928,[2] is n extensively used in France. Le Patronage l'Enfance has as its object the protection of orphans children in unsuitable surroundings and of delinquent Every child has a psychological examination, and t principal medical officer of the neuropsychiatr clinic gives directions for future care. Over 60 p cent. of the children are found to have some ment abnormality. At L'Asile de Villejuif there is special section for criminal types of patients, many them high-grade feeble-minded delinquents. D Colin, the superintendent, was specially interested these people and knew of some 200 of them who we improperly housed in prisons or asylums. He w able to open two blocks for men in 1910. Ea patient has a single room with fixed bed and so suitable occupation. Everything is designed prevent the concealment of knives and forks, and t tools in the racks form a pattern which makes t absence of any one conspicuous. At the Mais Blanche, an institution opened in 1900 for wom only, there was an interesting type of impervio floor made of sawdust, magnesite, and magnesiu chloride. Nurses are instructed, and examined written paper and orally in administration, hygie sick nursing, anatomy, physiology, psychology, ment nursing, and pharmacy. The salaries are about 10 francs a month. At Maison Blanche there is a crec for the young children of married nurses; quite number of the nurses are married women. T main impressions summarised by Dr. Evans ar the single portal for all mental patients; the pleasin well-lighted, and ventilated wards; the separa buildings of single rooms for noisy and dangero patients; the lay directorship, which does not see calculated to encourage initiative in medical welfa or pathological research; the well-chosen diet; a the attention given to prophylaxis.

Sir Charles Martin, whose Croonian lectures on t thermal adjustment of man to external conditio we are about to publish, leaves for Australia at t end of the year to take up the position of Director the Division of Animal Nutrition under the Commo wealth Council for Scientific and Industrial Researc This Council is a reflection of the Department f Scientific and Industrial Research in this countr and its laboratories are situated in the grounds the University of Adelaide, field experiments bei conducted in various parts of the continent where a assortment of nutritional troubles are encountered b stock-raisers.

[1] An Account of a Tour of Some Mental Hospitals and Clinics of the Department of the Seine. London: Adlard and Son, Ltd. 1930. Pp. 18. 1s.

[2] THE LANCET, 1929, ii., 936.

CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS

A Series of Special Articles, contributed by invitation.

LXXXII.

THE CLINICAL SIGNIFICANCE OF SLIT-LAMP APPEARANCES.

PART II.*

The Conjunctiva.

IN the normal conjunctiva we are able to observe with the slit-lamp the circulation of the blood in the finer vessels, more especially those at the limbus. The nerves may be made apparent. As a senile change, pinguecula may be observed earlier than by other means. In injuries to the eye a small perforation of the sclera by a flying fragment may be suspected when we find a dark subconjunctival hæmorrhage that has arisen from injury to branches of the anterior ciliary vessels. The peculiar cystic appearance of scars after a trephining operation may be examined. It will be found that they are always associated with pigment scattering throughout their walls. In cases of argyrosis the pigment will be seen to be in the epithelial layer of the conjunctiva, likewise the pigmentation seen in siderosis. The pigment in Addison's disease will be seen as patches, in the interpalpebral space, in the conjunctiva only.

The Cornea.

When examining the cornea it is necessary to eliminate the reflex from its surface, in the same way as in ordinary examination in focal light; that is, observation in the direction of the direct reflection of light is avoided. This is achieved by illuminating at a relatively high angle the portion of the cornea to be examined, and making an observation in the direction of the optic axis. The cornea may be examined by transillumination, by the light reflected from iris and lens, and the method of examination in the zone of specular reflection may also be applied. Observations have been made on the thickness of the cornea, and figures obtained by this method are at a variance with those obtained by post-mortem examination. Post-mortem measurements suggest that the cornea is 0·8 mm. to 1 mm. in thickness, whereas the figures obtained during life are from 0·583 mm. to 0·641 mm.

In the normal cornea the optical section, sufficiently narrowed, will reveal that the epithelial layer may be distinguished from Bowman's membrane; that the corneal stroma is not homogeneous. Nerves will be visible, and if the posterior band of the cornea, that reflected by the posterior surface, be examined in the zone of specular reflection the endothelium of the cornea arranged as a mosaic may be seen. An important congenital condition is buphthalmos, and here besides the bedewing (œdema) of the epithelium, we are able to distinguish ruptures of Descemet's membrane, mainly by their sinuous course, bright edges, and absence of endothelium upon their posterior surface of the cornea where the rupture has occurred. Arcus senilis as a senile change is seen earlier than by other means, and a faint haze in the neighbourhood of the cornea will be seen in the optical section. Among important traumatic lesions it is possible to decide whether a foreign body has perforated the cornea, so that it lies partly in the cornea and partly in the anterior chamber. This point is of considerable importance when deciding the means which should be adopted for its removal. A minute examination may be made of the posterior surface of the cornea which will be found powdered over with tiny particles of uveal pigment after a contusion.

Perforating wounds will be distinguished by the fact that folds are produced in the membranes of Bowman and Descemet. Folds of the structureless membranes of the eye have been elucidated by the peculiar behaviour of the reflexes produced. This phenomenon is well exemplified by considering the transparent paper in which it is the habit to wrap soap, food, and chocolate boxes. So long as this paper is perfectly flat it is invisible, but when thrown into folds it produces twin reflexes. The structureless membranes in the eye are the membranes of Bowman and Descemet, the capsule of the lens, and the retina, and all these when folded are visible by the reflexes they produce. In siderosis of the globe the corneal optic section is yellowish in colour. Alterations in the thickness of the cornea are easily appreciated when a narrow optical section is produced. Thinning is usually produced by loss of the anterior surface, as in ulceration, thickening by an infiltration that causes a bulging background of the posterior surface into the anterior chamber, as in disciform keratitis.

BEDEWING OF EPITHELIUM AND ENDOTHELIUM.

Two important phenomena are well demonstrated by the slit-lamp—namely, bedewing of the epithelium and endothelium. These are well seen by transillumination, the cornea appearing to be covered in droplets of fluid. Epithelial bedewing has been well known, for instance, as a condition accompanying glaucoma, but the importance of endothelial bedewing has been shown by means of the slit-lamp. It gives the appearance of much finer droplets than when the epithelium is affected and has been shown to be an early sign in diseases of the uveal tract. The endothelium in these circumstances when it is examined in the zone of specular reflection, shows that the sharp outline of the cells has been lost and that characteristic islets appear. Upon these islets precipitates form, and in this way the earliest stages of deposits upon the posterior surface of the cornea ("K.P.") are detectable.

Little of importance has been shown by the examination of corneal scars. Vascular changes are easily examined, best by transillumination. In this way not only may the superficial and deep vessels be distinguished but the movement of corpuscles may be followed by quite low magnification. In all inflammatory conditions the nerves are unduly prominent. Corneal precipitates are easily examined and their early appearances noted, so that early indications of uveitis may be detected long before grosser precipitates may be seen by the loupes in common use. It is interesting to note that the precipitates which accompany heterochromic cyclitis are always grey in colour. Although pathological pigmentation of the cornea was known before the introduction of the slit-lamp, we are now able to see these changes more regularly. A transverse pigmented line (Hudson's brown line) is seen in certain corneal opacities. Stähli has described a similar line occurring in an otherwise normal cornea. Fleischer's ring is characteristic of conical cornea whose base is

*Part I. appeared last week.

partially or wholly encircled. Kayser's ring is seen in Wilson's disease (hepato-lenticular degeneration) and occurs in Descemet's membrane. A fusiform deposit of pigment grains (Krukenberg's spindle) occurs on the back of the cornea in certain cases of myopia. By means of the slit-lamp our knowledge of conical cornea has been increased and certain small constant features discovered. In Fuchs's epithelial dystrophy changes in the endothelium as the earliest signs have been established. In disciform keratitis the backward bulging of the posterior parts of the cornea is well seen, as well as the frequent localised exudate upon the most prominent part of the bulge. Finally, an early diagnosis of parenchymatous keratitis is possible, even before any injection of the eye has occurred, for the cornea shows epithelial bedewing, cloudy opacities, and localised thickening.

The Anterior Chamber.

The only method of examination that can be used for the anterior chamber is that of focal light. It is possible, however, to examine the aqueous by the beam projected through it, against the unilluminated background. In this way we may see floating particles, uveal pigment, blood corpuscles, and so forth. These particles are seen to be in constant movement, rising in front of the iris and falling behind the cornea. They demonstrate thermal currents in the aqueous, due to the fact that the aqueous in contact with the iris is warmer than that in contact with the cornea. This phenomenon is the explanation of the Erlich-Türk line seen on the back of the cornea after injecting fluorescein into the vein of the rabbit's ear. A deposit of cellular elements, apparently white blood corpuscles, is seen in 50 per cent. of children along this line. The deposit of uveal pigment on the back of the cornea in cases of Krukenberg's spindle is also along this line.

Persistent pupillary membrane is often visible with the slit-lamp and is found to be much commoner than was previously thought. After contusions of the eye pigment granules are seen in the aqueous. In subluxation of the lens a prolapse of vitreous is seen protruding through the pupil, always covered with brown pigment granules. Slight changes in the aqueous are seen early even before actual particles are visible. A change in the constitution of the aqueous is shown by the visibility of the beam of light as it passes through the anterior chamber (flare). Any doubt as to the presence of an anterior chamber after an operation for glaucoma may be easily settled by observing if there is any gap between the light reflected by the cornea and that by the lens or iris.

The Iris.

In the examination of the iris focal light and the method of transillumination may be used, since the iris has behind it a reflecting screen in the lens, especially if it be opaque. It is easy to observe, in irides not too heavily laden with pigment, that the iris consists of three layers; the retinal pigment layer is visible at the pupillary margin, the anterior mesoblastic layer extending from the ciliary border to the collarette, and the posterior mesoblastic layer from the collarette to the pupillary margin. At the junction of the anterior and posterior mesoblastic layers the angle of Fuchs is seen. It is from the collarette that the remains of the pupillary membrane arise and their marked elasticity will be appreciated as the pupil alters in size. The sphincter iridis may be seen in pale irides if the iris be illuminated by a well-focused beam in its immediate neighbourhood on the pupillary side (indirect illumination). The common congenital anomalies are those seen in connexion with partial or complete coloboma. This usually occurs below and when complete the retinal pigment layer will be seen along the edge of the coloboma. When incomplete we may have an aplasia of the anterior mesoblastic layer or merely a pit. In melanosis of the iris the surface of the iris may show an irregular surface and the fact that the iris is hyperpigmented is known by the particles of pigment seen on the sclera at the point of perforation of the anterior ciliary vessels and possibly in the fundus. Senile modifications are commonly seen and consist of atrophic changes and disintegration of the pigment. In atrophy when the iris stroma becomes thinned and loses a good deal of its pattern the iris becomes slaty gray, due to the retinal pigment layer shining through. The sphincter iridis may become unusually visible. Disintegration of pigment is a constant senile change. This may be seen at the pigment border and elsewhere in the retinal pigment layer. The result is that the iris becomes translucent in these situations and the pigment becomes scattered over the surface of the iris, the lens, and the posterior surface of the cornea and may be seen moving in the thermal currents of the aqueous. The suggestion in the past that these changes have a relation to cataract and glaucoma is probably erroneous. In injuries to the eye the iris may be involved, showing ruptures of the pupillary margin or hæmorrhages into the substance of the iris that may be seen only by indirect illumination. Many years after a blow upon the eye the iris may become darker in colour. In perforation of the iris in intraocular foreign bodies the hole may be observed by focal light and transillumination through the sclera when a red glow will appear in the perforation.

Interesting points have been raised in connexion with exudative changes in the iris. Apart from tuberculous and syphilitic nodules, certain other nodules are seen near the pupillary margin, especially in chronic irido-cyclitis. Since similar nodules have been seen on strands of pupillary membrane quite apart from the iris they are apparently of the nature of precipitates. Their transitory nature also tends to support this view. As a result of inflammation atrophic and pigmentary changes are seen in the iris. These are often present in the neighbourhood of posterior synechiæ. In heterochromic cyclitis the iris becomes much paler in colour. Early pigmentary disintegration is seen by transillumination.

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SUNDERLAND'S MEDICAL SERVICES.—Dr. A. Stuart Hebblethwaite, medical officer of health for Sunderland, has prepared a scheme for the reorganisation of the medical services of the borough in consequence of the transfer of the medical functions of the public assistance committee to the health committee. Dr. Hebblethwaite points out that there is need for a fully developed municipal hospital with the same staff and standard as the present voluntary hospitals which have long waiting lists, growing rather than diminishing. He suggests that the municipal hospital at Highfield should be made a central clearing station for the town, from which all cases requiring hospital treatment could be sent to suitable institutions. This would ensure complete coöperation between the present voluntary hospitals and the municipal hospital and would avoid the overcrowding of the one and the depletion of the other. He further recommends that all surgical operations upon patients in the municipal hospital should be performed there instead of sending them to the voluntary institutions.

SPECIAL ARTICLES

THE CASUAL POOR.

A STUDY OF ECONOMIC AND SOCIAL FAILURE.

THE recent report of the Departmental Committee n the Relief of the Casual Poor [1] includes the result : an investigation by Dr. E. O. Lewis of the types : person who fall into this category. As about 2,000 casuals are relieved in England and Wales n any one night it was necessary to conduct the quiry on some plan which would give representative sults, and for this reason Dr. Lewis and his colleagues sited 15 casual wards in various Welsh and English wns, and interviewed 592 persons in all. It was n investigation, in essence, of those men and women ho have failed economically and socially and the asons for such failure may be either physical infirmity, ental infirmity, temperamental defects, psycho-urosis, criminal tendencies, or merely overwhelmingly lverse environment. To assess the important factor any individual case and during a brief interview as a matter of difficulty, especially as the chief ject was to ascertain the proportion of casuals who uld be classified as persons of abnormal mentality. r. Lewis appears to have given borderline cases both mental deficiency and insanity the benefit the doubt; so that his figure for the incidence of eblemindedness is probably rather low. His diffi-lties were increased by the extremely limited ld of interest, and the ignorance, sometimes iteracy, of many of the casuals, which made the plication of any large number of standardised sts out of the question. The interview was nducted as an informal talk from which it was ssible to make some estimate of the mental capacity; this appeared to be normal a rapid physical examina-n was made of the chest and the man was dismissed. r. Lewis observes that the most cursory physical amination was appreciated as a sign of good faith, hile if the subject had an inkling that a mental vestigation was being made he regarded it as a rsonal affront. As the women in the casual wards re few in number it was decided to include uthwark Casual Ward, where special arrangements e made for the reception of women vagrants in e London County area.

MENTAL DEFECT.

Among the group of 592 casuals investigated, 93, 15·7 per cent., were mentally defective, and from is it was estimated that there are about 1800 mental fectives nightly in casual wards in England and ales. There was a complete absence of imbeciles d idiots, who would have been lacking in even the all degree of intelligence necessary for a vagrant e. The casual with the lowest intelligence examined d a mental age of 7, but most of those who were entally defective had mental ages of 8 or 9. There as a tendency among them to attach themselves to her vagrants of better intelligence, sometimes to eir advantage; occasionally, however, their dis-ility was exploited by an unscrupulous companion. ost of them were subnormal in physique, and showed less foresight than their fellows in the care of their feet; their clothing with few exceptions was below the average of that of most casuals. Among the 50 women examined the incidence of feeblemindedness was slightly higher than among the men.

The impression formed of the mental capacities of most of those who did not fall into the mentally defective group was one of subnormality; men and women of normal or supernormal mentality among them formed a small minority. Such a conclusion, Dr. Lewis points out, should be borne in mind when formulating plans to prevent the social failure of such persons in the future; their inefficiency even as unskilled labourers makes them incapable of retaining a situation long. The total number of insane casuals interviewed was only 32, of whom 20 were cases of senile dementia; the remainder included 2 cases of dementia præcox, 4 of manic-depressive insanity, 3 of toxic psychosis, and 3 of paranoia. In only two cases was the condition so severe as to demand treatment in a mental hospital. Symptoms of some form of psychoneurosis were found in 34, or 5·7 per cent. of casuals, in several of whom the condition appeared to have developed as a sequel of a war neurosis; the commonest form was a state of anxiety, due in many cases to a failure to secure work. Often the adoption of a life of vagrancy appeared to be a reaction of flight from an unhappy environment. Neurotic cases of the psychasthenic type were not uncommon, but hysteria was rare and found for the most part among the women, usually in association with alcoholism. In view of these findings Dr. Lewis advises a periodic medical examination of all casuals by practitioners with an interest in psychiatry.

PHYSICAL DEFECT.

It was impossible in the course of such an investigation to make an exhaustive search for physical defects, but attention was paid to any symptom of which a casual complained, with the result that 43 cases of circulatory disease, 75 of chronic alcoholism, and 27 of diseases of the respiratory system were found. Other common physical disabilities were hernia, varicose veins, failing vision, malnutrition, and minor deformities such as ankylosed joints and spinal curvature, or due to rickets and war injuries. Osteo-arthritis and skin diseases were surprisingly rare. In the absence of suitable tests it was impossible to determine the incidence of venereal disease. A periodic medical examination would prevent the deterioration of slight disabilities into serious conditions, Dr. Lewis considers, and would extend the working life of casuals for several years.

The age distribution of casuals gave 13·8 per cent. under 30 years, 66·6 per cent. between 30 and 60, and 19·6 per cent. over 60. None of the women casuals was under 30, and only one child, a few weeks old, was present in the wards visited; the total number of children belonging to the group, according to the information received, was 35, of whom 8 were in the charge of relatives and 10 were under the care of the poor-law authorities or charitable organisations; no information could be obtained about the remainder. Marriage appears to be rare among casuals, no less than 80 per cent. declaring themselves to be unmarried. When questioned on their employment, 80 per cent. admitted to being unskilled labourers, 15 per cent. had performed some kind of skilled work, and less than 5 per cent. had held clerical positions.

A casual was classified as "habitual" when he had

[1] Ministry of Health. Cmd. 3640. H.M. Stationery Office. p. 99. 1s. 6d. The members of the Committee were Mr. A. Dale, Mr. Douglas Hacking, M.P., Sir Arthur Lowry, r. A. C. Parsons, Mr. A. Paterson, Rev. L. R. Phelps (chair-an), Mr. Arthur Shepherd, M.P., and Mrs. Wintringham, with r. L. N. Ure of the Ministry of Health (secretary).

visited casual wards at fairly frequent intervals for a period exceeding one year, and 81·9 per cent. of the total fell into this class; it was estimated that approximately one-third of habituals were not seeking work. Yet whether judged by moral, intellectual, social, or economic standards, Dr. Lewis finds the vagrants of the casual wards better than large numbers of men and women seen from time to time in common lodging-houses, and advises that no innovation be considered which would have the effect of increasing the numbers in such houses, where owing to less adequate public control the vagrant proves a greater menace to the community. He suggests that there should be closer coöperation in the administration of the lodging-houses and the casual wards.

The Committee's Recommendations.

These follow the opinion of Dr. Lewis in the matter of medical examinations; they suggest that these should be made once a month, but on no fixed day, and should include every inmate of the ward at the time. In addition, the officer in charge of the ward should make a practice of bringing to the notice of the doctor any casual who appears to be ill or mentally disordered. Facilities for bathing should be available for every casual on admission, and his clothes should be handed over for storage, so that the need for searching will disappear; disinfection of clothes should only be carried out when necessary and not as a routine. It is advised that the period of detention should always include two nights unless the casual holds a "vacant ticket" issued by a labour exchange, which indicates that he has satisfied the exchange officer that he is seeking work in the district for which he is bound, and that he has a reasonable prospect of obtaining it. Useful and appropriate work should be available for the casual on the day of his detention, and the committee are of the opinion that this could be best provided by appointing a properly trained officer to supervise and instruct. Accommodation in the wards should include a waiting room, a receiving room, day rooms and grounds for exercise, and a separate sleeping cubicle for each casual. Suggestions are offered for improvements in the dietary by the inclusion of 2 oz. of meat in the midday meal, the compulsory addition of some vegetable other than potatoes, and the complete omission of gruel. Registration of casuals is recommended, and the segregation as far as possible of the younger men from the old habituals. Few constructive proposals are offered for reformative measures, but the committee advise closer coöperation between vagrancy committees, employment exchanges, and voluntary bodies willing and able to accept for treatment vagrants who wish to alter their mode of life; moreover, they recommend that local authorities should be allowed, by subscribing to suitable voluntary bodies, to encourage the formation of training centres or to establish such centres themselves. Coöperation could be effected by means of advisory committees representing the vagrancy committee, the standing joint committee or watch committee, the Ministry of Health, the employment exchange, and the interested voluntary bodies in the area. The coöperation of neighbouring councils by means of vagrancy committees is also recommended. It is hoped that, by giving individual attention to each casual, the man who enters the ward for the first time will be given an early opportunity to reinstate himself, while those suffering from some mental or physical disability will be referred to the appropriate institution for treatment; both measures would have the desirable effect of reducing the numbers in the casual wards.

LISTER INSTITUTE OF PREVENTIVE MEDICINE.

(Continued from p. 1370.)

Department of Biochemistry.

Ossification.—Dr. R. Robison has continued collaborate with Dr. Honor B. Fell, Director of t Strangeways Research Laboratory, Cambridge, the investigation of the development of cartilage a bones of the embryo chick, both in the egg and wh isolated and cultivated in vitro. The work has n been extended to the study of membrane bone, f which purpose the jawbone has been found mo suitable. Experiments on calcification in vitro ha been continued by Dr. Robison, Miss M. Maclec and Miss A. Rosenheim, and the formation of n deposits in slices of the bones of rachitic rats has be investigated under various conditions. Eviden has been obtained of the existence of two mechanis favouring calcification in hypertrophic cartilage, t enzyme mechanism producing supersaturation of t solution by increasing the inorganic phosphor concentration, and a further mechanism favouri deposition of salts from the supersaturated soluti thus formed. In order to gain information on t nature of this second mechanism Dr. Robison a Miss M. Maclean are studying the deposition calcium salts in colloid gels, under conditio similar to those used in the experiments with bo slices.

THE VITAMINS.

Dr. S. S. Zilva has continued his investigation the spontaneous inactivation of the antiscorbu factor, and more light has now been thrown on t cause of the modification of the stability in neut solutions of the vitamin produced by autoclavi active solutions. The investigation instituted ascertain whether a functional relationship exi between the antiscorbutic factor and any other fac or factors in the apple and in citrus fruits has be extended in several directions. The inquiry into t vitamin content of dairy products as influenced environment, breed of cow, transit, storage, a other factors has been continued by Dr. Zilva, M Crawford, and Miss Perry, and a further number controlled samples of butter has been assay Attempts are being made to improve methods vitamin assay.

Work on the isolation of vitamin B_2 is bei continued by Miss Harriette Chick, D.Sc., and Miss Copping. They are endeavouring to prepare co centrations of this vitamin from egg-white, in wh it occurs unaccompanied by vitamin B_1, and fr mammalian liver.

Miss Chick, Miss M. H. Roscoe, and M Copping have made a quantitative study of the h stability of vitamin B_2 in yeast and yeast extra and of its sensitiveness to the presence of alk Their finding that vitamin B_2 is very sensitive alkalies at high temperatures is opposed to the c clusions of other workers in this field (Drummond a co-workers; Reader), who consider that vitamin is stable to the action of alkalies at high temperatu but that yeast contains an additional dietary fact "vitamin B_3," which is heat and alkali-labile.

Evidence that a third, hitherto unrecognised, diet factor exists in yeast has been accumulated in the cours the above research, but the evidence points to its be heat-stable. For example, the growth of young rats "synthetic" diets in which the vitamin B_1 is provided

eter's concentrate and the vitamin B_2 by preparations om egg-white, is inferior to that attained when the latter tamin is furnished by autoclaved yeast products. Further, ie repeated failure experienced, in common with other orkers, in attempts to breed young from rats reared to aturity upon diets which contain all the recognised ecessary B vitamins and other dietary factors also points the existence of at least one unknown factor which is dispensable for correct nutrition.

Search for this unknown substance is being made mong both purified substances and ordinary odstuffs.

Using the methods of assay with young growing ts worked out in this department, Miss Roscoe as extended the work on distribution to green and ot vegetables and has found lettuce, cabbage, and inach to be valuable sources of vitamin B_2, and uch richer in this vitamin than in vitamin B. r. Aykroyd (Beit Memorial Research Fellow), present assisted by Miss Gaffikin, is continuing on larger scale the previous work on the cereals (wheat, e, maize, millet and their constituent parts) with the m of throwing further light on the epidemiology of llagra. Foods rich in vitamin B_2—viz., meat, ilk, eggs, and green vegetables, coincide with those hich have been found most effective in practice for e prevention and cure of this disease.

Cereals as a class, however, are poor in this vitamin. t since pellagra occurs almost exclusively among maize ters and is almost unknown among populations whose aple food is wheat, rice, or millet, the vitamin B_2 content milled maize should be found appreciably lower than that the other milled cereals, if lack of vitamin B_2 is to be cepted as the primary cause of the disease. For it is likely that the association of pellagra with maize could be cidental and due to deficiencies in other constituents of e maize-eaters' diet. Attention is also being paid to e possibility that some toxic factor may be present in aize.

The cereals above mentioned are also being assayed r their content of vitamin B_1 to see if the results e in accord with the vitamin (B_1) theory of the iology of beri-beri. Dr. Aykroyd spent the summer 1929 in Newfoundland and Labrador for the rpose of investigating food deficiency disease among e population. Beri-beri was found to be fairly mmon and to affect chiefly the poorest among the hermen. Clinical observations in Labrador fit ll with experimental evidence with regard to beri-ri. Some investigations were also made on functional ght-blindness, a condition not uncommon in wfoundland and often thought to be associated th faulty diet. It occurred among those whose ts were obviously deficient in vitamin A and lded at once to treatment with vitamin A-containing ods.

Biological Value of Proteins.—Dr. Margaret A. ixsen, in collaboration with Miss Chick, is investigating the biological value of proteins and the possible e played by vitamins B_1 and B_2 respectively, determining the minimum intake of nitrogen cessary to secure equilibrium. A satisfactory hnique has been evolved using the adult rat as perimental animal. The experimental results ggest that both vitamins are required for an onomical use of nitrogen. The effect is, however, indirect one, for absence of either causes a loss of petite. The diminished calorie intake is apparent about 48 hours, by the utilisation of some of the imal's own protein to supply fuel. The power of e rat storage of vitamins B_1 and B_2 would appear be very limited.

Most previous estimations of the biological value of ferent proteins suffer from the defect that an inadequate pply of B vitamins was provided during the observations, materials rich in them also contain enough nitrogen to viate the experiment. In the method used by Dr. Fixsen the necessary B vitamins are administered as concentrates containing only minimal amounts of nitrogen; it is hoped, therefore, to obtain more trustworthy estimations of the biological values of the proteins contained in the commoner foodstuffs than has hitherto been possible.

Carotene and Vitamin A.—The exact relation of carotene to vitamin A has been, and, to some extent still is, problematical. It is quite clear that when vitamin A is derived from animal sources, such as liver-oils or butter, carotene cannot be responsible for the whole vitamin A activity, for there is no apparent quantitative relation between the vitamin A value and the depth of yellow coloration. In plants, on the other hand, the relation between depth of yellow colour and biological activity seems to hold good throughout.

The fact that vitamin A cannot always be carotene has tended to discount the possibility that it sometimes may be. This fact, coupled with Prof. J. C. Drummond's pronouncement that highly purified carotene has no vitamin A value, had caused the subject to be dropped, although the association of carotene and vitamin A activity in plant organs is so striking that it could hardly be fortuitous.

The problem was attacked again recently by Euler, to whom it appeared possible that omission of vitamin D from the basal diet of the experimental rats might have accounted for Prof. J. C. Drummond's failure to find carotene active as a source of vitamin A. After much work and the examination of samples of Prof. Drummond's carotene, Mrs. Smedley Maclean, D.Sc., Miss M. Hume, Prof. Drummond, and Dr. Euler identified the factor causing the discrepancy, and it is now generally accepted that highly purified carotene has the power to function as vitamin A, though it cannot be affirmed with absolute certainty that the activity is not due to the presence, as an impurity, of the colourless substance which represents vitamin A in liver oils. If this is the case, the impurity, it must be supposed, is always present in a definite quantitative ratio, and defies all ordinary chemical methods of separation.

The behaviour of rats during and after the experimental period of testing for vitamin A suggests that there is still some factor or factors, not included in the diet, which ought to be present for growth and development to be normal when vitamin A is added; the absence of this factor or factors mars any long-term dietary experiment and is constantly under investigation, concurrently with the vitamin A tests.

Department of Experimental Pathology.

RATE OF HEAT-LOSS FROM A SWEATING BODY.

Dr. A. J. Canny (Rockefeller Fellow, Sydney) and Sir Charles Martin have completed their investigations into the laws of cooling of moist bodies.

Evaporative, convective and radiant heat losses have each proved to be accessible to experimental determination. A large number of experiments made under varying conditions of atmospheric temperature and humidity and in winds of different velocity have been made. They have shown that a simple, even if lengthy, formula which includes no term that cannot be justified on physical principles, may be used to predict the rate of loss of heat from a given moist body under any environmental conditions. For this prediction only the wet and dry bulb temperature of the atmosphere, the wind speed and the internal temperature of the cooling body need be known. Several constants must be available to allow of a calculation of heat loss, but these are easily obtained in a simple system by a few experiments. In particular it has been shown how the temperature of the evaporating surface itself can be measured. This is a quantity whose value seems so far to have eluded experimenters in this field.

It is hoped that the principles developed will be of general application though the absolute quantities obtained in this investigation are applicable only to the particular system used.

ENDOCRINOLOGY.

Hormones of the Anterior Pituitary.—Active extracts from the anterior portion of the pituitary gland can be made both by acid and alkaline watery solutions.

Dr. V. Korenchevsky finds, in confirmation of Evans's experiments, that the former stimulate the development of the generative organs and the cortical portion of the adrenals, whereas the latter have the opposite effect. At the same time the nitrogen metabolism of animals is reduced below the normal.

Department of Protozoology.

EFFECT OF GAMMA IRRADIATION ON BODO CAUDATUS.

The knowledge of the cultural conditions of *Bodo caudatus* obtained in the course of her previous work has been used by Dr. M. Robertson in an attempt to test the effect of exposure to radium upon the growth of cultures under various experimental conditions.

Bodo is very resistant to the gamma rays and the actual death of a culture has not so far been achieved by exposure to a combination of radon and radium equal to 175–200 mg. of radium (screened with 0·5 mm. of lead sheeting) at a distance of 1 cm. for five days.

Two types of experiment have been tried. In the first an actively growing culture is divided equally between two hard glass tubes. One of these is exposed to radium; the other is not and serves as the control. From these two tubes, plates are made at various intervals under precisely parallel conditions. The growth on the plates is followed by means of sample films made at intervals; the films are stained and the numbers in division and the various phases of division are counted per thousand individuals. A second type of experiment is now being worked out in which the bodos are cultivated upon plates but in such a manner that the plate sequence—of initial lag and active rise of multiplication which drops gradually to a cessation of division with high absolute numbers and a final dying down to low numbers in an almost quiescent state as regards division—is reduced to a minimum, and the bodos, which are moved daily on to a fresh plate, are kept multiplying continuously at an approximately uniform rate.

This work is being carried out in association with Mr. Bernard W. Williams of the Surgical Unit at St. Thomas's Hospital.

Department for the Study and Preparation of Antitoxic Sera.

Experimental Production of Pneumococcal Endocarditis.—Dr. G. F. Petrie's experiments have now furnished clear evidence that recurring blood losses predispose to the production of valvular lesions in highly immune rabbits which are given repeated intravenous doses of living virulent pneumococci. The experiments, as a whole, throw some light upon the pathogenesis of infective endocarditis in man, for they indicate the risk of an infective valvular lesion lighting up in consequence of the leakage of bacteria (streptococci or pneumococci) into the blood stream from a cryptic focus, especially in a patient who is suffering from a secondary anæmia. An acquired immunity to the infective organism does not necessarily interpose a barrier to the lodgment and proliferation of the cocci upon the endocardium.

Poliomyelitis.—A horse has been successfully immunised by Dr. W. T. J. Morgan by repeated intramuscular inoculations with a filtrate of a potent poliomyelitis virus. The serum has been tested on monkeys by Dr. Fairbrother and found to possess antiviral properties comparable with convalescent sera. During the whole course of the immunisation no definite signs of a reaction in the horse were observed. The different serum proteins have been separated and purified by the methods in general use for the concentration of diphtheria and tetanus antitoxins. The examination of a limited number of such preparations makes it appear that a considerable part of the antiviral substance is in the euglobulin fraction. The reconcentrated pseudoglobulin and the serum albumin are apparently free from the protective substance.

MEDICINE AND THE LAW.

The Duties of a Police Surgeon.

It has lately been necessary to make a publi protest against misconceptions as to the duties of police surgeon. Proceedings had been taken in th Manchester City Police-court against a man charge with having been drunk and disorderly and wit having assaulted a tramcar driver. It appeared tha when the accused was taken to the police station h asked for a doctor and that a telephone message wa thereupon sent to the divisional police surgeo The surgeon, it was stated, answered that it was n good his coming. Whatever the answer may hav been, it seems subsequently to have been twisted int a refusal to attend without a fee. The presidin magistrate commented upon the refusal as a breac of the surgeon's duty to the city and as a denial justice to the accused. His remarks received conside able publicity in a Manchester evening newspap that night under such headlines as "Doctor refus to see man—Bench insist on duty to city—Presidi magistrate's stern comments." Next day th magistrate withdrew his observations not unhan somely, explaining that he had spoken under misapprehension and that the police surgeon had be under no obligation whatever to attend in consequen of the telephone message. It was thereupon explain to the magistrate that a police surgeon is not municipal official. He renders his service under agreement. The public has no call upon his service His agreement is that he will attend at the reque and on the instruction of the police to make certa examinations and certain reports and, if necessar to give evidence. Being thus a potential witness f the prosecution, he seems hardly the most appropria person for an accused person to call in as a prospecti witness for the defence. Perhaps in no other count but Britain, where the fairness of quasi-offici witnesses for the prosecution is so conspicuous towar the accused, could it be thought that a division police surgeon was at the beck and call of eve defendant.

The magisterial comments, which otherwise mig considerably have damaged a medical practition both by charging him with laxity and selfishne in the execution of his duties and by prejudicing h reputation with his patients and friends, were th satisfactorily withdrawn and the incident end happily. The misunderstanding as to the poli surgeon has its parallels in the popular misconceptio as to the general practitioner. Not infrequent at coroner's inquests and elsewhere a witness complai that a doctor was summoned and callously refus to attend. Many who in their own persons insi upon a rigid limitation of their hours of daily to look upon the medical practitioner as an automat who never eats or sleeps and who never has public private engagements. A patient can be forgiv for forgetting the claims of other patients. But if peremptory demand for the immediate attendance a doctor is put as a matter of legal obligation, it necessary to say frankly that no such obligation known to the law. Nobody can compel a firm solicitors to accept him as a client, much less to atte him and take his instructions at midnight or Sunday afternoon. Analogy between the legal a medical professions is obviously imperfect owing the difference in the services which each rende But, as a matter of contractual relationship, there is more obligation in the one case than in the other.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

CHANGE IN THE SICKNESS INSURANCE LAW.

By a presidential order which is valid until the new Reichstag either agrees or disagrees, important alterations to the Sickness Insurance Law have been issued. Under the present bad economic conditions in Germany the sick clubs (Krankenkassen) were said to be unable to work under the old conditions, economy being essential. It was pointed out that members often abuse the help to which they are entitled by approaching the Krankenkasse even for imaginary ailments, by inducing medical men to prescribe medicine, or by reporting themselves unable to work in order to get sick pay. The principal items of the new order are that henceforth a member of a Krankenkasse has to pay 50 pf. (6*d*.) for the voucher which entitles him to consult a medical man; hitherto these vouchers were issued free of charge. He has also to pay the same sum to the pharmacy for every prescription. A Krankenkasse is also empowered to give its members higher sick pay, leaving it to them to consult medical men and to buy medicine at their own expense. The Minister of Labour stated in the Reichstag, where the health insurance was lately discussed, that the expenses for that insurance were much higher in Germany than in any other country. At the last meeting of the Aerztetag, where the order has been much criticised, the fear was expressed that the alterations in the law might result in a diminution of the consultations of medical men even in those cases where medical attendance is absolutely necessary. Still more important is a provision that medical officers are to be appointed to supervise the medical men engaged in insurance practice. Those medical officers will have the right to state whether a patient is to be attended at all or is able to work, or whether the treatment prescribed by a medical man is necessary or too expensive. In this way, it is feared, the freedom of the profession will disappear and medical service will be in charge of a corps of salaried medical officers. The Minister of Labour is, moreover, to have the right of cancelling a contract between a sick club and a medical organisation if the expenses of medical attendance are too high. The number of young doctors to be admitted to insurance practice is to be limited still further. The order is the most controversial measure put forward for many years, since it destroys all that has been done for the common good of the profession and the Krankenkassen. Although it is doubtful whether the new Parliament to be elected on Sept. 14th will pass the whole of the order, or whether it will have to be modified, there is undoubtedly a strong movement towards saving money in social insurance at the cost of the medical profession.

HEREDITY OF TUBERCULOSIS.

Dr. Vershuer lately read a paper before the Berlin Medical Society on his statistical and genealogical researches into the heredity of tuberculosis. Dr. Vershuer has attempted to compare twins produced from one single ovum with those produced from two ova. His material consisted of 75 pairs of twins, of whom 19 were from one ovum; of the other 56 pairs, 38 were of the same sex and 18 of different sexes. At the time of the research tuberculosis was manifest in one or both of the twins in 42 pairs, symptoms of healed tuberculosis were found in 19 pairs, and no symptoms of the disease were present in 14, although the twins came from a tuberculous "milieu." The twins were divided into three groups: (1) those where both showed the same liability to tuberculosis—to this group belonged 25 pairs; (2) those where one had a passing tuberculosis, or where tuberculosis had affected them both, but at quite different periods of life, or where disease was manifest in different organs, or though affecting the same organ, the prognosis was very different; (3) those where one of the twins had already died, while the other was still healthy. In the twins produced from one ovum it was found that tuberculosis of the same intensity became manifest in the same organ, and even if the twins were separated one from the other and lived in different places; while in the two-ova twins of the same group no case was found where the disease had the same characteristics. In the one-ovum twins liability to tuberculosis differed only until the age of 18 years; in the two-ova twins the difference increased with the age without external causes being responsible. In one-ovum twins the liability to tuberculosis and the similarity of symptoms were much greater than in two-ova twins. Dr. Vershuer concludes from his observations that heredity is an important factor in the pathogenesis of the disease.

MEDICAL EXAMINATION OF MOTOR-CAR DRIVERS.

Dr. Franz, of the Institute for Legal Medicine, holds that licensed motor-car drivers should be examined not only before the licence is granted, but periodically. Beginning at the fortieth year of age, such examination should, in his view, be carried out every second year. In this way the beginning of general paralysis, alterations of the blood pressure, or senile phenomena might be ascertained. After every accident the motorist should be examined with special reference to his mental functions. If an accident is suspected to be due to inebriety he suggests that the blood of the driver and his victims should be examined in a medico-legal institute in order to ascertain the quantity of alcohol present.

DEATH OF PROF. FÜRBRINGER.

Prof. Paul Fürbringer, whose rules for prolonging life based on his own experiences were mentioned in these columns last year,[1] has died in Berlin at the age of 81 years. He was for long chief physician to the Friedrichshain Municipal Hospital; he resigned that appointment some years ago but continued in private practice, and was a recognised expert in medico-legal work; the generally adopted method of cleaning the hands before surgical operations by washing them in a mixture of alcohol and sublimate of mercury was based on his bacteriological research, and was first recommended by him. Fürbringer's vitality was enviable; he indulged in walking, swimming, skating, and mountaineering until recently, notwithstanding his advanced age. He was a genial man and much liked by the profession in Berlin.

THE LÜBECK DISASTER.

The number of deaths in Lübeck as a sequel to mistakes committed in the Calmette treatment has reached 62. The judicial prosecution of the physicians of the general and the children's hospital respectively and of the medical director of the Lübeck Health Office is still in progress.

[1] THE LANCET, 1929, i., 844.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

INFANT PROTECTION IN HUNGARY.

At the recent meeting of the Budapest Royal Medical Society Dr. Nikolas Pfeiffer spoke of the exceedingly low birth-rate in Hungary in the post-war years, and of the measures whereby the level of population could be maintained. One method was by lengthening the average duration of human life; another method was in the improvement of the living chances of the groups most exposed to the risk of death, such as new-born infants. For the reduction of neonatal mortality, which is high in Hungary, the means suggested are greater antenatal and intranatal care. The insurance of motherhood should be extended, and not only more direct material assistance but a thorough reform of the midwifery service is essential. The organisation for the protection of infant and mother should be expanded to cover the agricultural class, which at present is left out. Among the postnatal schemes the injection of B C G is advocated. A defect in the present organisation is the lack of elasticity. Local schemes should be assisted and supplemented not according to the size of the population but to the rate of infant mortality in the district concerned.

THE RELIABILITY OF CANCER STATISTICS.

According to a lecture given in the Medical Society of Budapest by K. Wolff, the method of preparing cancer statistics should be revised. The only reliable statistics are those founded on diagnoses established in vivo, post-mortem protocols, on histological sections, and, finally, on the data afforded by compulsory death certificates. Unsupported clinical diagnoses of cancer, according to calculations, are erroneous in 20 to 40 per cent. of cases and, therefore, exact statistics cannot be expected without histological controls. The verdicts of coroners, some of whom are not medically qualified, are quite unreliable. Thus statistics which appear to prove the increase of cancer mortality may indicate only the development of the science of medical diagnosis; whereas cancer mortality rises in such statistics, the number of cases labelled senile marasmus, unknown disease, and other indefinite diagnoses decreases. Nowadays all well-trained doctors know that nobody dies solely from senile debility. If the patient had no other disease he would be certain to have had myocardial degeneration or a broncho-pneumonia. Post-mortem statistics are also unreliable, because they do not reflect the conditions of the whole population, but of the hospital class. This objection holds true still more with regard to the statistics based on histological material alone. The fewer the cases utilised in the compilation of cancer statistics, the less reliable are the results. In one hospital the leading surgeon may have a predilection for cancer cases; hence the cancer turnover is high. Another hospital hardly admits cancer patients, because its surgeons work on other lines; the number of cancer cases here will be low. Such sources of errors can be eliminated by the collation of the material of many hospitals, when those which have large children's departments will serve to balance others dealing almost exclusively with cancer cases. Thus a fairly accurate picture of the conditions of population could be obtained, but only of the hospital class. The statistics hitherto published do not prove, in Dr. Wolff's opinion, the assumption that the rate of mortality from cancer shows a rising tendency. A relative rise is the obvious corollary of the fact that the number of deaths from other curable and preventable diseases is diminished. But this means no more than that we are at present unable to defend ourselves against cancer, because we know neither its cause, its therapy, nor its prophylaxis. The average duration of life is increasing steadily all over the world. Cancer is the disease of elderly persons. If the average duration of man's life increases, then there are more elderly persons—that is to say more people reach the age at which cancer is apt to occur. It may well be that the number of cancer cases shows considerable increase with the rise of the average duration of life. In Dr. Wolff's view the apparent increase in the incidence of cancer has been too much emphasised. The mortality-rate of every disease displays some oscillations if we comparatively scrutinise the statistical material available over several years. Wolff protests against the interpretation of what may be only natural oscillations as a progressive rise in incidence.

At the same meeting Dr. Ö. Zalka also expressed the opinion that the mortality statistics of cancer leave much to be desired. According to his observations the error in cases of gastric cancer is 31 per cent., in uterine cancer 7 per cent., in rectal cancer 19 per cent., and in œsophageal cancer 130 per cent. The statistics collected by him show no progressive increase of cancer, its occurrence being fairly constant. For instance, between 1919 and 1923 among the autopsies in the Budapest University Clinics on patients over 20 years of age the cancer rate amounted to 12·4 per cent., while between 1924 and 1928 it amounted to 12·52 per cent. Since in quite recent years a larger proportion of different sections of the population seek relief in hospitals, and are subjected to routine post-mortem examinations, he believes that the data provided by post-mortem statistics to-day are nearer to reality, and more nearly representative of the truth, than the older statistics.

THE NERVOUS AND MENTAL INDICATIONS FOR ARTIFICIAL ABORTION.

Dr. P. Büchler, of the Budapest University, holds the view that artificial abortion is indicated in case of severe reactive depression, when the patient displays obstinate resistance against taking nourishment, or if she develops suicidal tendencies. Even in these cases institutional treatment must first be tried, and abortion is indicated only if this treatment is not practicable. In an institute resistance to food can be defeated by the application of forcible feeding and suicide can be prevented by careful watching, but even in institutions the pregnancy may have to be terminated. Most difficult is the problem of schizophrenia. Although it is beyond dispute that the reproduction of schizophrenics is undesirable our efforts must be directed to the prevention of gestation rather than its interruption. There are no definite general indications in psychiatry, but in psychopathies arising from severe intoxications and infections, and in certain cases of paralysis, interference is justified, and, at any rate, danger to the life of the mother can be avoided. As a rule, when a psychosis is suspected Dr. Büchler recommends the conveyance of the patient to a mental hospital where the physician in charge can take what action he deems necessary. The sphere of neurological indications is also narrow. Severe cerebral and spinal diseases form absolute indications for abortion. Disseminated sclerosis is an important one, because this disease tends to progress after childbirth; palsies, ataxia of a greater degree, and the quick loss of

strength may follow. This holds true also for locomotor ataxia, inasmuch as after childbirth ataxia increases and bladder and intestinal troubles may supervene. That spinal and cerebral tumours, syringomyelia, progressive spinal muscular atrophies, hereditary chorea, lateral sclerosis, and severe forms of epidemic encephalitis form absolute indications is beyond dispute. In doubtful cases Dr. Büchler holds that social and eugenic considerations may be allowed to influence the decision, but only in minor degree.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

EPIDERMOPHYTOSIS.

THIS disease, which is also known by a host of pseudonyms such as "athletic foot" or "swimming-pool itch" is believed by many dermatologists to have taken first rank among skin diseases in this country. It is supposed to have been imported by American soldiers returning from the war. Probably the majority of regular habitués of gymnastic halls are now infected with this distressing parasite. It abounds in schools and colleges and seems to be spread especially in damp places such as shower baths and swimming pools. One measure of prophylaxis that has been suggested is to arrange for bathers to soak the feet in 15 per cent. solution of sodium hyposulphite before putting on their shoes and stockings. The following recommendations have been issued by the New York State Department of Health.

1. Inspection of the feet and toes of all bathers and exclusion of those showing infection. The disease may show around the base of the nails or between the toes as a raw open sore or as small or large blisters, or it may resemble eczema.

2. As the fungus will grow readily on silk and cotton goods, leather and probably on damp wood, all equipment such as benches, stools, diving boards, steps, rubber mats, and floors should be washed daily with a strong solution of chlorinated lime or soda. Canvas mats or pads should be abolished.

3. Prevention of exchange of unsterilised towels, suits, or bathing slippers.

POISONOUS PROPERTIES OF MAPLE SUGAR "SAND."

The New York State Department of Health has recently examined and reported on samples of maple sugar "sand" to the consumption of which the death of two children in the State had been attributed. The children had found an old can containing some of this chalk-like substance, had filled the can with water and drunk the solution. They developed a violent gastro-intestinal inflammation with profuse stools containing blood, marked prostration, and rapid lowering of body temperature before death. The sample of "sand" examined in the State laboratories was obtained by filtration of freshly made maple syrup. It was found to be a complex substance consisting mainly of calcium malate. Since magnesium malate is known to produce severe diarrhœa in adults in doses of 9 g. or more it seems probable that calcium malate was the poison responsible for the children's deaths.

HEALTH WORKERS TO TOUR MEXICO.

The American Public Health Association is to hold its annual meeting this year at Fort Worth, Texas, from Oct. 27th to 30th. At the close of the conference a special tour of Mexico is to be undertaken by invitation of Dr. Rafael Silva, the chief of the Mexican Health Department, with the approval of the President of the Republic who has invited the delegates to visit him in his historic castle. A special train will be at the service of the delegates.

INSANITY AND THE LAW.

The degree of responsibility of a criminal cannot be settled, it is now admitted, either by definitions or by a board of experts; there will always be honest differences of opinion which cannot be subjected to any scientific test. The important matter is not a philosophical conception of free will, but a practical question of the future behaviour of the criminal. Let the jury decide, then, whether or no the prisoner at the bar actually committed the crime. The prisoner is then to be studied by a board of experts with a view to prescribing treatment for the correction of his anti-social behaviour and the protection of society. The following five principles have been adopted both by the American Bar Association and, at its recent meeting, by the House of Delegates of the American Medical Association. 1. That there be available to every criminal and juvenile court a psychiatric service to assist the court in the disposition of offenders. 2. That no criminal be sentenced for any felony in any case in which the judge has any discretion as to the sentence until there be filed as a part of the record a psychiatric report. 3. That there be a psychiatric service available to every penal and correctional institution. 4. That there be a psychiatric report on every prisoner convicted of a felony before he is released. 5. That there be established in each State a complete system of administrative transfer and parole, and that there be no decision for or against any parole or any transfer from one institution to another, without a psychiatric report.

AUSTRALASIA.

(FROM OUR OWN CORRESPONDENT.)

THE PRIMARY FELLOWSHIP EXAMINATION.

THE College of Surgeons of Australasia have officially announced that they have received notice that the College of Surgeons of England will hold a primary Fellowship examination in August, 1931. The examination will be held in Melbourne, presuming that not less than 25 eligible candidates are found desirous of being examined. There is no doubt that all who can will take advantage of this opportunity, but even under the present arrangements distance is still a factor. Melbourne is the most central city for the purpose, but it is still a long way to come from outlying parts. Many have expressed some disappointment that it has not been possible to arrange for the papers to be set concurrently in Adelaide, Melbourne, and Sydney, and for the viva-voce examinations to be held in each city separately. It is understood that this suggestion was made to the Australasian College, and no doubt there were good reasons why it has not been accepted. Nevertheless, such a scheme would give more prospective candidates an opportunity to take the examination.

BROKEN EXPLORATORY NEEDLES.

It was something of a coincidence that the issue of THE LANCET with recommendations about the breakage of hypodermic needles (May 17th, p. 1083) should have arrived in Sydney during the progress of an action, the result of such a mischance. This action was one of more than usual interest, because the doctor had not disclosed to the patient the fact that the needle had been broken. The patient had two brothers who were doctors, and the broken needle was accidentally discovered by X rays. Briefly the facts of the case are as follows. The plaintiff alleged that on Friday, Jan. 30th, 1928, the doctor was performing an exploration of his chest, broke, or allowed to break the needle he was using, but did not

in the after-care of his patient take appropriate steps to guard against the harm which might have been caused by the presence of the needle. The action was attributed to negligence, and it was further alleged that the fact that the doctor concealed the presence of the broken needle from the patient also amounted to malpractice. Subsequently the needle had caused the plaintiff suffering and financial loss. An operation for empyema was performed about an hour after the exploration. The evidence showed that the patient was suffering from bronchiectasis. The defence was an admission of the accident but a denial of negligence. It was stated that the needle had broken off during a fit of coughing whilst the doctor was emptying pus from the syringe. The doctor contended that it is impossible to tell a faulty needle by its appearance, and further that the present condition of the patient was the result of bronchiectasis. Numerous expert witnesses testified that in its present position the needle was doing no harm. The reasons given by the doctor for not telling the patient, X raying him, or attempting to remove the needle, were that in the serious condition of the patient it would have been unwise to have informed him or his wife of the accident, that as he felt certain it was doing no damage he took no further steps in the matter, and further, that operation for removal of the needle would have been harmful.

The jury in their verdict found that negligence had been proved and awarded the plaintiff costs at £100. There is no doubt that the fact of the doctor not disclosing the breaking of the needle weighed heavily against him. A number of questions concerning broken needles arose during this case: the responsibility of the doctor for the use of an unsound needle, the propriety of not telling the patient that the needle had been broken; if the fact is disclosed, when and to whom it should be disclosed in the case of a patient who is seriously ill; the responsibility of the doctor for taking steps necessary for the recovery of the needle or to guard against possible harm caused by its presence.

PUBLIC HEALTH SERVICES

RESULTS OF ARTIFICIAL LIGHT TREATMENT FOR TUBERCULOSIS.

By G. Lissant Cox, M.D. Camb.,
CENTRAL TUBERCULOSIS OFFICER, LANCASHIRE COUNTY COUNCIL.

THE following brief account of treatment by artificial light is based on a report for the year 1929 presented to the Lancashire County Council. Light centres have been established at 12 of the 24 tuberculosis dispensaries in the administrative county. Treatment at each dispensary has in the great majority of cases been given by two carbon-arc lamps (Sunrae pattern) for general treatment, and one Kromayer mercury-vapour lamp for local treatment. For obstinate cases it has been found helpful to resort to ancillary forms of treatment, such as curetting, cauterising, aspiration, or application of ointment.

Summary of Results.

1. Artificial light treatment, undertaken at dispensaries by the tuberculosis officers and tuberculosis health visitors, has continued in 1929 to give satisfactory results, particularly in regard to patients suffering from tuberculosis of the skin and tuberculous adenitis with abscess formation and skin involvement, which conditions are very slow in yielding to other forms of treatment.

2. Of the total patients attending light centres, 77 per cent. were able to continue their normal occupation during the course of treatment.

3. 30 per cent. of the patients treated during the year were assisted by the payment of their railway, 'bus, or tram fares to the dispensary light centres.

4. In regard to the 60 skin cases which became "quiescent and apparently cured," the average duration of the disease before the patients commenced light treatment was 10 years 8 months, whereas the average duration of light treatment was 10½ months.

5. For the 252 cases which became "quiescent and apparently cured," the average duration of the disease before the patients commenced light treatment was 4 years 8 months, whereas the average duration of light treatment was 9 months.

6. The average cost of artificial light treatment at the 12 centres amounted to 4*s*. 6½*d*. per patient per week.

RESULTS OF LIGHT TREATMENT IN 1929.

Form of tuberculosis or part of body affected.	Cases on treatment on Jan. 1st, 1929.	Cases commencing treatment in 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons.*	Still under treatment
			Quiescent an apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofuloderma)	167	109	60	12	2	1	35	16
Adenitis with abscess formation and skin involvement	87	133	87	6	—	—	21	10
Adenitis without softening	57	99	55	9	3	—	31	5
Bones, joints, and spine	56	41	26	5	5	—	24	3
Abdomen	12	30	13	1	2	1	6	1
Other non-pulm. conditions	17	12	10	1	1	—	4	1
Pulm. tuberc.—								
Lungs—								
sputum pos.	1	3	—	—	1	—	—	
sputum neg.	—	2	—	—	—	—	—	
Bronchial glands	—	4	—	—	—	—	2	
Pleura	1	1	—	—	—	—	—	
Pulm. and non-pulm. tuberc. combined	5	5	1	—	—	1	6	
Total for 1929	403	439	252	34	14	3	129	41
	842							
For comparison, the total in 1928 was	153	573	190	23	10	1	99	40
	726							

* Includes: (1) any patient who did not receive two months' treatment; (2) patients ceasing light treatment prematurely, e.g., removals, unwilling or unable to continue; and (3) patients transferred to sanatoria or hospitals.

7. Of the 252 cases concluding treatment in 1929 on becoming "quiescent and apparently cured" the consultant tuberculosis officers would normally have recommended 211 for treatment at hospital. Based on the average duration of treatment of such cases, the cost would have been not less than £478, whereas their treatment at the dispensary light centres actually cost (all inclusive) £2240—a saving of £2552.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of Edinburgh and three English county boroughs :—

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Edinburgh .. (427,538)	17·1	15·1	1·10	1·77	2·6	2·2	80/35	39	7·0
Liverpool .. (872,802)	21·6	15·1	1·46	1·27	4·2	1·3	96/30	74	3·5
Coventry .. (172,000)	14·2	11·5	1·03	1·24	2·7	1·7	73/32	55	4·1
Derby .. .. (140,500)	19·0	13·5	0·87	1·46	2·7	2·7	64/27	34	3·7

Stillbirths per 1000 live births: Edinburgh (notified) 5·6, Liverpool, 4·0, Coventry 4·0, Derby 4·4.

Edinburgh.

Dr. William Robertson's report shows that Edinburgh is tackling energetically a tremendous problem of housing and slum clearance. The houses in the city number 107,704 and include 7233 one-roomed and 32,298 two-roomed dwellings. The municipal houses provided up to the end of the year numbered 5758, of which 866 had two rooms, 4502 three rooms, 252 four rooms, and 138 five rooms. Four slum clearance schemes affecting 2359 houses and a population of 7048 have been completed, including the first section of the St. Leonard's scheme. In 1929 no deaths occurred from measles, although 338 first cases were reported. The outbreak of influenza lasted seven weeks and at the peak caused general death-rates of 32·9 and 29·2 in the first two weeks of February. Since 1898 the cancer death-rate for both sexes has gone up from 0·8 to 1·8. The 76 notifications of enteric fever included a mild outbreak of 30 cases of paratyphoid B with no deaths, which appeared to be associated with the milk from one dairy. The ultimate source of infection could not be traced. Diphtheria was unusually prevalent but the case fatality was much lower in 1928 and 1929 than in previous years. The aspiration method of treatment was tried in a few laryngeal cases and a more extended trial will be made with an electric suction pump. The case fatality of scarlet fever was only 0·3, the lowest ever recorded in the city. Anti-toxic serum was administered in 38·6 per cent. of the 938 patients admitted to hospital. There is need for more hospital accommodation for advanced cases of tuberculosis. The mortality-rate of the 149 puerperal fever cases was 16·7 per cent. Dr. W. T. Benson, resident physician to the isolation hospital, asks for more observation wards for doubtful cases.

The bacteriological examination of the water of the swimming baths confirms the Ministry of Health's (August, 1929) report that all swimming baths should be fitted with a filtration plant, which constantly filters and chlorinates the water. Dr. David Lees notes a marked increase to 54 in the percentage of cases of syphilis presenting themselves at an early stage. He records a decrease in congenital syphilis, attributed to the treatment of the mothers during pregnancy.

Of 17 cases of gonococcal ophthalmia 11 were from Edinburgh and 6 from outside areas; of these latter, 2 cases were sent into hospital at the age of 1 month with one eye already irreparably damaged. As a rule the adulteration of milk is small in degree, but in June 40 gallons of "morning" milk and 30 gallons of "evening" milk were sent into the city by motor from a farm in Lanarkshire. The "morning" milk was 20 per cent. deficient in fat and contained 24 per cent. of added water; the corresponding "evening" milk figures being 14 per cent. and 26 per cent. The defence of the consignor was that the cows had been out on grass of a very poor quality and were not receiving artificial food, whilst in addition a leakage had been detected in the milk cooler. He was convicted and fined £8. During the year 39·4 per cent. of the dairy cows slaughtered at the abattoir were affected with tuberculosis in some degree. The Victoria Hospital tubercle-free herd passed successfully through its two six-monthly tests; and the associated grazing farm in Peeblesshire used for raising young stock has also been kept tubercle-free. The municipal dairy herd kept for the supply of the city hospitals was also maintained in a tubercle-free condition. The percentage of tuberculous milk coming into the city from outside has been lower during the past three years.

Liverpool.

Dr. A. A. Mussen says that the excess of mortality caused by the influenza epidemic chiefly occurred at ages 65 and upwards. Concurrently with the influenza there was an extensive outbreak of measles, and towards the end of the year both scarlet fever and diphtheria became prevalent, taxing the accommodation at the City hospitals. There were 3989 notifications of scarlet fever with 41 deaths—a case fatality of 1·0 per cent. In one school containing about 250 children immunisation was carried out with satisfactory results. The notifications of diphtheria numbered 2336 with 139 deaths, a case fatality of 5·9 per cent. The attack-rate from diphtheria is persistently higher in the outer wards probably owing to the more complete notification of the milder cases. The death-rate is usually highest in the central wards, but in 1929 it was highest in the middle ring, the children having been attacked at an earlier age.

Suicides from gas poisoning showed an increase to 49 compared with an average of 24 for the previous four years. The accidental deaths due to this cause numbered 9. About 65 per cent. of the births are attended by midwives, who coöperate well with the antenatal clinics. There are 28 of these at 15 centres conducted by consultant obstetricians. The new cases which attended during 1929 numbered 11,454 and the total births were 18,888. Dr. Mussen points out that in addition to the 66 maternal deaths, which gave a rate of 3·5, there were 21 other deaths of mothers associated with childbirth, which would bring up the rate to 4·6. The Seamen's V.D. clinic has again demonstrated its value. The new cases of syphilis show a slight decline, the figures for the last three years being 459, 435, and 413; whilst the new gonorrhœa cases show an increase, the figures being 931, 1031, and 1112. Very few gonorrhœa cases come up for treatment at an early stage, and the figures show that 25 per cent. of the syphilis cases appear for treatment in the pre-Wassermann stage, 24 per cent. with primary sore and positive Wassermann, 8 per cent. during the secondary stage, and fully 40 per cent. in the stage of later or latent syphilis.

The bulk samples of city milk examined numbered 327, of which 13, or 3·97 per cent., were tuberculous. Of 197 samples of fresh milk supplied to the city hospitals tubercle bacilli were found in 5, and of 337 samples of milk supplied to maternity and child welfare institutions, 4 were tuberculous. Insanitary houses at the end of the year numbered 1868, 1362 being court houses and 506 front houses contiguous to them.

The want of alternative accommodation in the central area bars rapid progress with improvement schemes, or the enforcement of closing orders. The confirmation by the Ministry of Health of the Queen Anne-street improvement scheme comprising 5¾ acres in the central area was recorded last year but

was quashed in the Court of Appeal. The new municipal dwellings in the suburbs now number 18,201 and 169 flats, and 897 more houses are in progress.

Coventry.

Dr. Arthur Massey submits the report for the last full year's work of Dr. Snell, who retired on Jan. 31st, 1930, after more than 30 years administration of the office. The general death-rate was the highest since the great influenza year of 1918, and although Coventry did not suffer as badly as some districts, there was also a marked rise in infant mortality due mainly to respiratory diseases. The continuance of diphtheria was also a disquieting feature. There were 431 notifications and 37 deaths, a case-fatality of 8·6 per cent. Immunisation was begun and 1171 school-children were protected. If this work is to have an appreciable effect, says Dr. Massey, it will need to be undertaken on a much larger scale than the general parental attitude of to-day permits. The housing problem is made more difficult to solve by the rapid growth of the population. Dr. Massey would like to see use made of Section 3 of the 1925 Act, which gives the corporation power to do the work of reconditioning in the owner's default. Dr. Massey mentions some of the industries of Coventry which reflect the trend of modern life. They include motors, airplanes, artificial silk, electrical industries, printing, watch making, machine-tool making, and general engineering. The town is surrounded by a ring of fine commons and atmospheric pollution is less than in many industrial towns. The small river Sherbourne traverses the city from west to east and is much polluted by refuse. It has to be periodically cleaned. Flooding has been troublesome in low-lying districts and is to be prevented. A new sewage disposal plant by bacteria beds at Finham is in progress. The bacteria beds and activated sludge unit at the old sewage farm will also be retained.

Derby.

Dr. Gordon Lilico submits the report for Dr. Brindley's last year of office, owing to the latter's indisposition. He states that the very young and the very old formed the greater number of the influenza victims. Towards the end of the year scarlet fever became very prevalent and overtaxed the accommodation at the isolation hospital. The report from the V.D. clinic at the Royal Infirmary shows increased attendances. There were 77 notifications of small-pox and one death. The fatal case was a male aged 61, vaccinated in infancy, who died before admission to hospital, the cause of death being certified as "pneumonia, influenza, small-pox." The midwives attend about one-third of the confinements. There is a wide difference in the maternal mortality according as one uses the local or the Registrar General's classification of the deaths. The former allocates 4 deaths to puerperal sepsis and 13 to other accidents, &c., while the latter gives 5 deaths to puerperal sepsis and 5 to other accidents, &c. The maternal mortality is, therefore, either 3·7 or 6·3 per thousand births. Of 54 samples of milk examined for tubercle, seven were found to be infected. In each case the milk came from farms in Derbyshire, and six diseased cows were found and slaughtered. At one farm no diseased cow was found.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 9TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 86 (last week 70); scarlet fever, 1501; diphtheria, 976; enteric fever, 82; pneumonia, 461; puerperal fever, 45; puerperal pyrexia, 120; cerebro-spinal fever, 14; acute poliomyelitis, 15; acute polio-encephalitis, 1; encephalitis lethargica, 12; dysentery, 13; ophthalmia neonatorum, 99. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 12th–13th was as follows: Small-pox, 209 under treatment, 2 under observation (last week 218 and 10 respectively); scarlet fever, 1750; diphtheria, 1917; enteric fever, 41; measles, 191; whooping cough, 78; puerperal fever, 17 (plus 10 babies); encephalitis lethargica, 119; "other diseases," 24. At St. Margaret's Hospital there were 10 babies with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was one death from small-pox, 3 (1) from enteric fever, 14 (8) from measles, 3 (0) from scarlet fever, 11 (1) from whooping-cough, 26 (5) from diphtheria, 45 (5) from diarrhœa and enteritis under two years, and 10 (1) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Islington (metropolitan borough); in addition a death belonging to Wallasey (C.B.), which occurred outside that area during the week ended July 26th, is now reported. The deaths from enteric fever outside London were reported from Reading and Grimsby. Three deaths from diphtheria were reported from Liverpool, 2 each from East Ham, Nottingham, and Bradford. Manchester reported 5 deaths from diarrhœa, Liverpool and Tynemouth each 3, West Ham, Warrington, Hull, Gateshead, Rhondda, and Swansea each 2.

The number of stillbirths notified during the week was 288 (corresponding to a rate of 47 per 1000 births) including 55 in London.

REPORTS OF SCHOOL MEDICAL OFFICERS.

—	No. on roll.	Average attend-ance.	Routine inspec-tion.	Special exams. and reinspec-tions.	Percentage of defects.
Derbyshire..	75,235	—	23,191	8,479	26·1
Hull	47,065	42,212	14,268	51,977	23·1
Warrington .	13,253	11,534	4,178	4,928	15·34

Derbyshire.

Dr. W. M. Ash reports that the work has continued on similar lines to those of the past four or five years; coördination of the various medical services being maintained; the assistant school medical officers are responsible for the child welfare centres in their areas and the school nurses, with few exceptions, are also the health visitors. The orthopædic scheme has been developed; a full-time orthopædic surgeon now attends each of the ten clinics scattered throughout the county and the number of children attending them has risen from 920 in 1928 to 1114 in 1929. Bretby Orthopædic Hospital has been extended by the addition of a 50 bed open-air block which was ready for admissions in January, 1930. Dental work shows progress and considerable increase in numbers attending, though there was a small decrease in the number of sessions held, owing to the resignation of one dental officer and the illness of another. It is interesting to note that the number of children made dentally fit (8362) very nearly coincides with the number of school entrants (approximately 8400), which suggests that even with the present staff every child could be made dentally fit at some time in its school life. But following up and re-treatment make necessary an increase of staff which is to be provided in the coming year. A special investigation on orthodontics was made by Mr. M. Lewis, L.D.S., who found that nearly one-third of the children he examined had some irregularity of the teeth. In over half the cases the irregularity was associated with nasal obstruction. Irregularities of the teeth were found to be twice as common in breast-fed as in bottle-fed children. There is apparently a lack of day special schools belonging to the authority. A good number of totally blind and totally deaf children are maintained in suitable schools, but the lack of accommodation for mental

defectives and epileptics in the county is acute, and there is great difficulty in dealing with the cases of combined defect. Two interesting investigations were carried out. Dr. H. S. Bryan examined the general intelligence level of Peak District children, and showed that their average intelligence quotient, calculated on the Stanford Revision, was 99·4—that is to say, the scale is generally applicable to these children. Dr. F. J. Burke investigated lung diseases in school-children, and found that they are often associated with septic tonsils, adenoids, and other morbid conditions of the upper air passages.

Hull.

Dr. W. A. Daley has left Hull to take up a public health appointment in London after only a brief period of office, but the fruits of his organising capacity are to be found in the report to which his successor, Dr. W. M. Frazer, writes an introduction. In the 1927 report the need of myope classes, of an open-air school, of provision of X rays for ringworm, and of an increased dental staff was urged. Now a myope or sight-saving class has been provided whose only fault is that it is not yet large enough; there are open-air classes being held, and an adequate open-air school is under construction. Treatment of ringworm by X rays is working with success, and has just been made available for pre-school children; and this year the dental staff has been again strengthened by the appointment of two more dental officers and a dental attendant. Last year Dr. Daley described his scheme of dividing public health work into four sections: (1) tuberculosis; (2) maternity and child welfare; (3) school medical service; (4) port sanitation and infectious disease. All these services were to be coördinated so that the staff of any division could come to the help of another in case of need, and that the institutions and facilities belonging to each would be at the service of the others. This scheme has now been in operation for some time, and this year lists are given of cases referred from one division to another. Dr. J. Morrison, who is responsible for a large section of the report, writes appreciatively of the coöperation between the school medical department and the general public health department in matters affecting the control of infectious disease in school-children. The coöperation is especially close in relation to the pre-school child, the number of these infants treated at the clinic being over 1000 in addition to 12 cases treated by plaster splints at the Park Avenue Special School. In many other matters improvement is chronicled; a minor example is that of the restriction of casual dental cases. Previous reports gave the reasons for preferring systematic dental treatment and prophylaxis to "last moment" action. This year the number of casual cases has fallen to the very low figure of seven, and experience in 1929 again showed that the public appreciated the fairness of the policy. Only in one respect is this report disappointing. In the report for 1928 it was stated that an orthopædic hospital appeared to be in prospect; this year it is noted that very little progress has been made with the scheme. Special investigations include a scientific study of impetigo in school-children by Dr. Morrison, and an experimental study of the results of the use of tonic medicine in schools by Dr. K. D. Mackintosh.

Warrington.

Dr. G. W. N. Joseph thinks that the relatively low proportion of defects found in Warrington is accounted for partly by the work of the maternity and child welfare committee among pre-school children, and partly by the efforts of the nurses in the schools. A table shows that among the school entrants who had previously attended a welfare centre only 21·5 per cent. were found to have defects, while among the other children the percentage was 31·2. It is clear that much successful treatment is carried out in the schools by the nurses, who also visit the homes and give advice to the parents on home treatment. The system of doing dressings in the schools has caused a great reduction in the loss of attendance due to minor ailments. A special inquiry showed that loss of attendance due to infectious disease is another important factor, but not the principal influence, since in 1922–23, when 128,347 attendances were lost owing to an epidemic of measles and mumps, the percentage of attendances was 91·5, an exceptionally high figure. This year the total loss of attendances through minor ailments and infectious disease together was 100,000, while 200,000 attendances were lost through disease for which certificates from private doctors were produced by the parents, the amount of loss through this last cause having markedly increased since 1921. Dr. Joseph believes that there is here a fruitful field of inquiry which will be made in the course of this year. At Warrington no open-air school, nursery school, or special school of any kind exists, and at present no system for provision of meals is operating. In two schools an excellent plan for the giving of milk, made possible by the self-sacrifice of the teachers, is producing good results, but other schools have not found it possible to adopt the scheme owing to lack of staff.

Rutland.

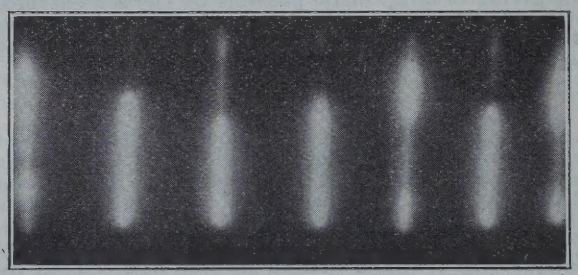
Dr. C. Rolleston, who is in charge of the smallest county in England, issues merely a brief typewritten report which does not reproduce the figures and statistical tables furnished to the Board of Education. In spite of the small numbers of children concerned, the facilities for treatment seem to be reasonably adequate in Rutland and to be well appreciated by the parents. The orthopædic scheme is much in favour; there was only one refusal of treatment. The operative treatment of tonsils and adenoids at the Oakham War Memorial Hospital is of high standard; 90 children have received attention by Dr. F. H. Wallace, but 121 still require treatment. The interest of the parents is illustrated by the large proportion (82 per cent.) attending the medical inspection of their children. This attitude is a great change from that of a few years ago, when the parents viewed the medical services provided with distrust and dislike. Even to-day, Dr. Rolleston says, a few exceptions remain. A mother refused to obtain treatment for her boy's vision, though it was only one third of normal; when she could hold out no longer against persuasion and pressure, including a warning from the N.S.P.C.C., glasses were obtained, but the mother then made a further stand. She realised she could be compelled to get treatment for her boy, but she protested that no law could compel her to force him to wear the glasses prescribed. Dental work has been hindered by a change of dentist, the post being left vacant through illness for two months last year. Improvement on the conservative lines suggested by the Board of Education has, however, begun, the number of permanent teeth extracted having fallen; there have also been many more fillings of temporary teeth, since the present dentist, Mr. L. A. McTaggart, does not favour the extraction of these teeth. The system of a travelling van is proving satisfactory, but the work needs acceleration. If the dentist cannot visit each school every year, children may be left without dental care for so long that some teeth may become unsaveable in the interval. The appointment of a skilled dental attendant or nurse would speed up the work, and it is clear that such an appointment should be made without delay. The duties of the school nurse include assisting in splint and plaster work at the Peterborough orthopædic clinic and giving lectures to elder girls on the hygiene of infancy. Several inquiries were made in the course of the routine work, notably about the proportion of children who had been breast fed, who were vaccinated, who had had symptoms of rheumatism, or who were working out of school hours. The numbers concerned are small, and no general conclusions could be drawn from them. Dr. Rolleston also carried out a special investigation of an acute epidemic at Morcott, which was presumably poliomyelitis with some special features.

CORRESPONDENCE

INEQUALITIES IN RADIUM TUBES.

To the Editor of THE LANCET.

SIR,—In this clinic we have read with great interest the article on Distribution of Radiation from Clinical Radium Tubes by Prof. S. Russ and Miss D. F. Clephan (THE LANCET, August 9th, p. 286). Our physicist, Mr. Hubert Lawrie, has been engaged in taking autophotographs of our needles during the last six months and we have been very perturbed on finding that the distribution, as shown in the photographs, is almost invariably uneven. The active material is usually found concentrated towards the



Autophotograph of seven radium needles with consecutive numbers, each containing 3 mg. element. The needles are 6 cm. long (5 cm. active length), 2·2 mm. external diameter, walls 0·6 mm. thick. Exposure 300 secs. The needle-points are directed upwards.

eye end and must obviously, as Prof. Russ says, militate against uniform irradiation since the action will be concentrated towards the surface in most interstitial applications.

The problem, therefore, that we are faced with is how to get this defective filling corrected. We have already tried tapping and shaking but without any effect so apparently the only solution is refilling. As there must be other clinics possessing similar unevenly filled needles it would be advantageous to all concerned to go into the matter on the lines suggested by Prof. Russ so that, if necessary, combined action could be taken to have defective filling remedied. The appended autophotograph of seven consecutively numbered needles confirms the statement made by Prof. Russ.—I am, Sir, yours faithfully,

JOHN H. WATSON, M.B., B.S., F.R.C.S.,
Director, Radium Clinic, Victoria Hospital,
August 14th, 1930. Burnley, Lancs.

COLOUR-VISION AND COLOUR-BLINDNESS.

To the Editor of THE LANCET.

SIR,—Colour-blindness seems to be occupying great attention at the present time. Two very important communications on the subject have appeared this year. The first a book by Prof. Henschen of Stockholm, on "Lichtsinn und Farbensinnzellen im Gehirn." Prof. Henschen claims that he has proved that there are distinct cells in the visual centre for the perception of light and colour, thus supporting my theory which he quotes.

The second is an article by Dr. William Christie, medical inspector of schools, which appeared in the *Medical Journal of Australia* for Feb. 22nd. Dr. Christie's remarks are based on the examination and re-examination of 20,000 school-children, and he used my classification, those examined being grouped according to the number of colours seen in the spectrum. He states, "One great advantage of Edridge-Green's system of classifying colour-blindness is that it enables us to foretell what colours will be selected to match another colour when once the spectrum of that boy has been obtained." Dr. Christie has made the surprising discovery that on re-examination there is a definite change in the degree of colour-blindness. About 25 per cent. of all persons improve. The same number get worse and the remainder are approximately stationary. Some improved to such an extent that Dr. Christie no longer regarded them as colour-blind.

I am, Sir, yours faithfully,
F. W. EDRIDGE-GREEN.

Board of Trade, August 14th, 1930.

TREATMENT OF PULMONARY TUBERCULOSIS IN SWITZERLAND.

To the Editor of THE LANCET.

SIR,—If the members of our profession will consider the reflections of Dr. Harrison carefully, these will influence the lives of a larger number of individuals in these islands than any other matter recently published in your journal. This statement may appear somewhat dogmatic but the widespread prevalence of tuberculosis gives it emphatic support. His article had a very special appeal to me because here, 1000 feet above sea-level, our winters are very severe, wet, and prolonged. We endure more than our fair share of snow, rain, and mountain mist, and reckon on a month more of actual winter weather than our neighbours at lower levels. We also suffer from lack of sunlight, and for many years I have seen, in the early months of the year, many fresh cases of pulmonary disease. Why should I send these unfortunates from this height to other heights in a colder land, far from their relatives and home interests? I admit this would reduce the number of "contacts" in this country.

Our practice has always been to send cases to our home sanatoria, our southern coast line and the Channel Islands, and our results have been most encouraging. It is a pleasure to see well-marked cases with pallor and tachycardia, irritating cough, and increased root shadow, whom we know to be contacts, return to us full of life and vigour. It is sad to watch the downward trend of cases unable to afford the two or three months treatment necessary. We have many excellent sanatoria, and it is unfortunate that they do not admit all early cases. At the same time we confess that the early cases are not very infective. Probably for those who can afford it residence on the high veldt of South Africa is the ideal treatment; but they should stay there. These cases relapse easily on return to this country.

I have just read Dr. Amrein's letter. It is remarkable how widespread his idea of our climate is on the continent. It is fortunate that our webbed toes and very sensitive touch corpuscles enable us to get about our business with such rapidity in this land of perpetual wet and gloom.

I am, Sir, yours faithfully,
R. S. MCCLELLAND.

Dowlais, South Wales, August 15th, 1930.

To the Editor of THE LANCET.

SIR,—I have read with interest the correspondence in your columns on this subject and I should like

take this opportunity to correct the impression ich Dr. Harrison's article may have made. My marks must be based on the only treatment centre Switzerland of which I have personal knowledge.

(1) *Situation.*—This centre has the great advantage being situated on a plateau and enjoys a superb w up and down the Rhone Valley, of which the e never tires. In contradistinction to the effect of nhappy constriction," to which Dr. Harrison refers writing of the Swiss landscape, a sense of open aces prevails. Facilities for walking are, I believe, tter than in any other Swiss resort; it is possible walk for an hour or so on the level in more than one rection. With regard to winter sports, Montana ice the war has ceased to count as a "sports centre" d has been given up almost entirely to the treatnt of tuberculosis.

(2) *Climate.*—No one would deny that the dry riss air is beneficial in cases of pulmonary tuberculis, nor the advantages of the increased appetite luced. Owing to its open position facing south, ntana receives the maximum amount of sunshine. e psychological effect of the sun cannot be overimated, and however strongly Dr. Harrison may ld a brief for our English climate the average nter day in England or Scotland affords little cheer the patient in bed and no encouragement to those shing to pursue "outdoor Nature study."

(3) *Sanatoria.*—Here lies the crux of the matter. is obvious from the letters in your columns and m my own observations that the administration many Swiss-run sanatoria is defective, especially th regard to nursing facilities, and that in some itances medical treatment differs considerably from at carried out in our own sanatoria. The al would seem to be a sanatorium in Switzerland uipped entirely by a British medical and nursing ff. Such a sanatorium is now nearing completion Montana.

I am, Sir, yours faithfully,

ndon, W., August 17th, 1930. DOUGLAS MCALPINE.

UMBILICAL HERNIA IN INFANTS.

To the Editor of THE LANCET.

SIR,—I think Dr. Eric Pritchard misses the point Mr. Wakeley's remarks on infant feeding. Wakeley does not say "artificially-fed infants"; t "infants brought up from birth on patent foods" a very different thing. A baby fed on properly uted cow's milk does not suffer from indigestion or nstipation, but an infant brought up on patent foods nost invariably does, and these, I gather, are the es to which Mr. Wakeley refers.

I am, Sir, yours faithfully,

J. HAMILTON HART.

Worcester Park, Surrey, August 15th, 1930.

FIRE PRECAUTIONS IN NURSING HOMES.

To the Editor of THE LANCET.

SIR,—More than half of my time during the past n years has been spent as a patient in nursing mes in London and seaside towns, so that I may im to be something of an authority on these instiions. I have already observed good results from e new system of registration and inspections. ere is one point, however, which well might receive e attention of authority—that is, the arrangements, lack of such, for removing those patients who are able to walk, in case of fire. In only two of half a dozen otherwise well-conducted establishments which I have lived in and others I have visited in choosing a place have I felt satisfied that there was any plan or understanding on which the staff would work in getting out patients after the start of a serious fire, particularly at night. It has been my experience that if a patient asks questions about the subject (particularly if he wants specific and detailed information) he is likely to get vague assurances that everything will be all right.

I have been a patient in three homes in which the control was entirely in the hands of a matron, and in two where there was no male member of the staff and no man on the premises at night, and where no apparatus for dealing with a sudden fire was visible. Only a small proportion of the nursing homes I know were built for their purpose. Most of them were originally dwelling houses and have been more or less remodelled for their present use. One of the best (in other respects) London homes I have been in as patient was a tall narrow house with very narrow halls and stairways. Getting a patient who must be carried out of doors from the third or fourth floor, as I know by experience, was a very slow and clumsy proceeding. What would happen if it became necessary to get several out quickly? The choice of a nursing home is made by most people on the recommendation of their doctors. Whether the average doctor feels that responsibility rests upon him to make sure that the place he proposes is efficiently organised in regard to such matters as are outside of his professional sphere I cannot say.

It seems to me that the establishment of regulations or standards regarding fire precautions and insistence that they are observed would be a most desirable reform. It is one that should be dealt with in advance rather than as the result of a coroner's inquest.

I am, Sir, your faithfully,

August 16th, 1930. PATIENT.

DRAINS.

To the Editor of THE LANCET.

SIR,—The leading article in your last issue on drains might lead one to suppose that drainage was of no importance as a cause of epidemic diseases. Are we to believe that a reversion to the state of affairs that existed in this country a hundred years ago would not be associated with a recurrence of the epidemics which, as you point out, were probably brought under control by the attention subsequently paid to all forms of sanitation, including drainage? In the *Times* of July 25th it was reported that typhoid is occurring in such volume at Leningrad at the present time as to cause serious concern, and the impression is conveyed that part of the cause may be the primitive system of cleansing and sanitation generally in that city. Scepticism, no doubt well justified, as to the connexion between drains and many of the infections should not lead us to discount the very great importance of sanitation, including drainage, in the prevention of at least some of them.

I am, Sir, yours faithfully,

August 18th, 1930. M.B.

*** We agree with "M.B.'s" general argument. We were careful to emphasise that there was a genuine case for the urge toward drainage and sewage disposal in the second quarter of last century, and that adequate drainage arrangements must be maintained on general principles. The important point, however, is to secure differentiation both in the medical and lay mind between those diseases which may be

attributable to faults of drainage and those which may not. Briefly, it may be said that a community which allows its water-supply to become contaminated by its drains, or permits flies to have access to its sewage in the crude state by failing to provide drains, is taking the risk of epidemics of the alimentary infections, such as typhoid, dysentery, cholera, and infantile diarrhœa; but that the diseases which are conveye mostly through the air by droplet infection, such diphtheria, scarlet fever, measles, influenza, and so o are not likely to be affected one way or the othe Historically there is no evidence that these latter ha diminished in incidence during the era of mode sanitation.—ED. L.

OBITUARY

JOHN ELDER MACILWAINE, B.Sc. Glasg., M.D. R.U.I., D.P.H.

THE sudden death on August 6th of Prof. J. E. MacIlwaine, at the comparatively early age of 56 years, has deprived the Belfast Medical School of one of its most distinguished and most scientific physicians.

John Elder MacIlwaine was born in Belfast in 1874, the son of John H. MacIlwaine, a well-known naval architect and engineer, and one of the pioneers of Belfast shipbuilding. It was natural that after his education at the Royal Academical Institution, Belfast, he should first of all enter his father's shipyard, and there serve his apprenticeship. He then went to Glasgow, where he took a University degree in naval architecture, but after his return to Belfast he abandoned this career for medicine. He had a brilliant career at Queen's University, then Queen's College, Belfast, where he was uniformly first in his examinations. Tall and strong, with a good turn of speed, he distinguished himself equally on the football field, and as a forward he had the honour of representing Ireland during three years in her palmy days of the nineties. A popular student, he took his part in the college life, his unusually sweet and vibrant voice being appreciated by his fellow students. While studying in Dublin during his final year the South African war broke out, and he promptly joined the Irish Hospital as a dresser. His work in South Africa was mostly medical, and he always spoke in the highest terms of his chief, the late Dr. J. B. Coleman, of Dublin.

On his return home MacIlwaine took the M.B. degree of the Royal University of Ireland with first-class honours, and then went to the continent for a prolonged period of study—Berlin, Vienna, where he spent almost a year, and then Paris. He then came home and served for a year as resident in the Royal Victoria Hospital, Belfast. After he had set up in practice he was connected with the hospital, first as medical registrar and medical tutor, and in 1911, on the death of Dr. W. B. McQuitty, he became assistant physician. He was always interested in diseases of the heart, and it was after seeing the work of Sir James Mackenzie at the London Hospital that he established an electrocardiographic department at Belfast in 1913 for which his early training in mechanics and engineering had so well fitted him. Having served many years as full physician to the Victoria Hospital, in 1929 he was appointed to a specially created post of physician in charge of the cardiographic department. During the great war he joined the staff of the St. John Ambulance Brigade Hospital at Étaples, taking out his own cardiograph with him, and his work done there on D.A.H. cases soon drew the attention of the medical authorities to its value.

After the war the chair of materia medica and therapeutics at Queen's University becoming vacant on the resignation of Sir William Whitla, Dr. MacIlwaine was elected and filled the post until 192 How much labour he expended on the preparati of his lectures and their revision year after year a what the strain of teaching a subject alien to h personal interests is known only to his intimate friend Gradually he restricted his consulting practice cardiac work, and he was one of the founders of t Cardiac Club in connexion with the Association Physicians of Great Britain and Ireland. His medic colleagues recognised his worth by electing hi President of the Ulster Medical Society and Preside of the North of Ireland Branch of the British Medic Association.

About five years ago Dr. MacIlwaine lost the sig of one eye from detachment of the retina and h general health began to fail. He resigned the cha in 1928 but not before he had persuaded the medic faculty of the University to adopt his schem laboriously and carefully worked out, for converti his chair into one of pharmacology with a train full-time professor of pharmacology at its head. H lived to see that department grow and develop und Prof. E. B. C. Mayrs, new laboratories furnished, and connexion established with the Royal Victo Hospital. In October, 1929, symptoms pointing detachment of the retina in his sound eye appeare A visit to Switzerland for the most recent treatme resulted in disappointment, and he bravely fac blindness and the whole readjustment of his li For some months before his death he was studyi the Braille system and hoped to be able to adapt to the reading of his large collection of electro-card grams, and thus pass some of his enforced leisure giving of his wide experience to medical literature.

A colleague, on whose knowledge we have alrea largely drawn, writes: "MacIlwaine excelled as clinical teacher, and drew a large crowd of students w were attracted by his lucidity and the practical natu of his bedside teaching. He keenly enjoyed lecturing his own speciality, and his early training in engineeri enabled him to draw many illustrations fr mechanics which helped the student in his und standing of the heart and circulation. He alwa urged the great necessity of ordinary methods clinical observation before making use of instrumen ones. In one of his last conversations with the wri he voiced the fear that the public were beginni to place an undue importance on the electrocard graph, and hoped that medical men would not all themselves to be forced to use it in cases of card disease where its employment was quite unnecessa His friends regretted that he did not write more his special subject, but his modesty made him hyp critical of the importance of his own work, and the fruit of his wide experience and patient investi tion is left ungathered. He inspired valuable resea in his wards and was ever anxious to assist in ev way the younger medical man. His life and wo quiet and unobtrusive, conscientious and thorou was an example to every medical student of what best in the art of medicine."

CHARLES BROOK, J.P., F.R.C.S. Eng.,
LIEUT.-COL., R.A.M.C. (T.).

Mr. Charles Brook, who died at Lincoln on ugust 10th, was a son of the late Dr. W. H. Brook, Lincoln, where he was born on Feb. 19th, 1839. fter a year's pupillage at the Lincoln County ospital he entered St. Bartholomew's Hospital, ondon, in October, 1858, the same year as Alfred illett, John Langton Morrent Baker, and Howard arsh, the first three of whom were his fellow house rgeons, whilst the latter, after the custom of that me, purchased the remainder of the house surgeoncy Mr. Skey, which Charles Brook resigned owing to e illness of his father, calling him to Lincoln. uring his student days he gained every scholarship d prize that he competed for; Sir James Paget ied to persuade him to remain in London as his sistant, and the treasurer and almoners added their surance of an early post on the surgical staff if he ould so remain. But Brook felt it his duty to carry his father's practice in Lincoln, which he joined 1862.

He was elected surgeon to the Lincoln County ospital in 1864, consulting surgeon in 1900, and vice-esident in 1921. In 1862 he was appointed surgeon the Royal North Lincoln Militia, from which he signed in 1891, but on the formation of the Territorial orce in 1908, at the request of Sir Alfred Keogh he ganised the Fourth Northern General Hospital. Here, uring the war, he took the principal surgical part om 1914 to 1918, when, whilst still active in mind d body, he was retired, at the age of 79, by reason the age-limit. In 1922 the Royal College of rgeons elected him a Fellow. A fine operator in his rlier days, Mr. Brook was during the whole of his reer distinguished for his clinical acumen, power of agnosis, and shrewdness in treatment, so that his lvice was sought after over a wide area. He was a ne sportman, a cricketer from his earliest days, keen follower of hounds, a fine shot, and able to amp over the heather until approaching 80 years age. He was chairman of the Lincoln Race Com-ittee, and at one time raced under the name of r. Seabrooke.

A man of sound business ability, Colonel Brook was n the boards of some of the principal business ncerns in Lincoln, being chairman of the Lincoln d Lindsey Bank (now merged in the Midland) d of the Midland Counties Insurance Company ow merged in the Royal). He was made a J.P. 1888. He leaves a son and a daughter, his wife d an elder son having pre-deceased him.

PROF. AXENFELD.

Dr. Theodor Axenfeld, who died at the age of 3 years at Freiburg i. Br. on July 29th, had held ie University chair of ophthalmology for almost) years. He was born at Smyrna, graduated at arburg, and was assistant to Uhthoff at Breslau efore his appointment at the age of 30 to the chair ophthalmology at Rostock, which he exchanged r that of Freiburg four years later. Axenfeld's name associated the world over with the pathology of phthalmic disease, and especially with that of spring tarrh, trachoma, and sympathetic ophthalmia. His *ehrbuch der Augenheilkunde* ran through seven litions and from 1904 on he edited the *Klinische Monatsblätter für Augenheilkunde*. His international anding made it possible for him to resume his place in 929 at the Amsterdam congress, and early this year e had made a tour in Japan where he was received with marked respect. Three of his pupils occupy the chairs of ophthalmology at Cologne, Münster, and Tübingen.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. B. S. Robson is placed on the Retd. List with the rank of Surg. Capt.

Surg. Lt. D. M. Beaton to be Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. J. F. Corr to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Capts. E. J. S. Bonnett and F. K. Escritt to be Majs. (prov.).

TERRITORIAL ARMY.

Maj. T. W. S. Hills, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Capt. A. B. Williamson to be Capt.

2nd Lt. J. K. Reid to be Lt.

Godfrey Morgan to be Lt.

ROYAL AIR FORCE.

J. F. S. Wiseman is granted a short service commission as a Flying Officer for three years on the Active List.

Squadron Leader T. K. Place (Major, Army Dental Corps) relinquishes his temporary commission on ceasing to be employed with the R.A.F.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. J. Prendergast relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE.

Capt. T. H. Thomas to be Maj.

Capt. (prov.) K. F. Alford is confirmed in his rank.

Col. L. J. M. Deas retires.

Lt. H. S. Bawa relinquishes his temp. commn.

DEATHS IN THE SERVICES.

Colonel John Southey Bostock, R.A.M.C., C.B.E., who died suddenly at Burford Priory, Oxford, on August 12th, aged 55, was Commandant of the Royal Army Medical College at Millbank. The eldest son of Dr. E. I. Bostock, of Horsham, Sussex, he received his early education at Lancing College, and graduated in medicine and surgery at Edinburgh in 1900. In the following year he joined the Royal Army Medical Corps as lieutenant, became captain in 1904, and major in 1912. He served throughout the great war both at home and abroad, and was in the retreat at Mons. On his return to England he took charge of the War Hospital at Eastbourne, and was director of medical services at the Ministry of Pensions from 1919 to 1923, when he was made C.B.E., and became Lieut.-Colonel, having been promoted to Brevet Major in 1915 and Brevet Colonel in 1918. Subsequently he was appointed principal medical officer at Hong-Kong, and in the early part of this year took up his appointment as Commandant at Millbank. He married in 1909 Olivia Emslie, daughter of Mr. Emslie J. Horniman, by whom he had two sons and one daughter.

CITY OF LONDON MATERNITY HOSPITAL.—The 179th annual report records that last year 1724 in-patients were treated at a cost of £7 17*s.* 6*d.* each for an average stay of 13·45 days, a reduction of 12*s.* 5*d.* on the preceding year. Of the in-patients seven died, two of whom were emergency cases; the mortality-rate for booked cases was 3·22 per 1000. There were 37 pairs of twins, and 72 stillborn cases. There were 251 out-patients delivered, and 256 children were born outside the hospital. In ante-natal and postnatal work 2070 patients were attended. In the infant welfare centre 431 mothers made 4629 attendances. Nineteen medical practitioners and students attended the practice in the hospital, and 40 midwives and six maternity nurses were in training during the year. The report emphasises the extreme urgency of rebuilding the nurses' quarters—the present lack of accommodation threatens the efficiency of the hospital.

MEDICAL NEWS

Mental Treatment Act, 1930: Approved Medical Practitioners.

The Board of Control, with the approval of the Minister of Health, have appointed a committee "to consider and advise what principles should be observed in the approval by the Board of Control of medical practitioners for the purposes of Sections 1 (3) and 5 (3) of the Mental Treatment Act." The committee is constituted as follows:—Sir John Rose Bradford (President of the Royal College of Physicians), who will act as chairman; Sir Hubert Bond (Commissioner of the Board of Control), Dr. R. G. Gordon (representing the B.M.A.), Dr. G. W. B. James (Royal Society of Medicine), Dr. A. Rotherham (Commissioner of the Board of Control), Prof. J. S. B. Stopford (General Medical Council), Dr. R. Worth (Royal Medico-Psychological Association), with Mr. H. C. Bleakley, of the Board of Control, as secretary. Under Section 1 (3) of the Act the application of the parents or guardian of any person under 16 for his admission to an institution for mental treatment as a voluntary patient must be accompanied by a recommendation from the usual medical attendant, or from a medical practitioner who has been approved for the purpose of making such a recommendation. Section 5 (3) refers to the medical recommendation which must accompany the application of relatives of a patient who is for the time being incapable of expressing himself as willing or unwilling to receive treatment for mental illness, but is likely to benefit by temporary treatment. This recommendation must be signed by two registered medical practitioners, of whom one must be approved by the Board of Control for the purpose of making recommendations under this section.

St. Thomas's Hospital.

The old students' dinner will take place at St. Thomas's House, Lambeth Palace-road, London S.E., on Oct. 3rd, at 7.30 for 8 P.M. The chair will be taken by Dr. R. Muzio Williams.

The following scholarships have been awarded for 1930. University Scholarship: H. F. Moseley, Merton College, Oxford. Hector Mackenzie Exhibition: I. H. Gosset, Magdalen College, Oxford. Entrance Scholarship in Arts: R. R. McSwiney and A. J. Belsey. Entrance Scholarships in Science: First, G. W. Hearn; second, W. E. Hadden and J. I. Lesh. William Tite Scholarship: L. E. Jones.

Chartered Society of Massage and Medical Gymnastics.

The second annual dinner of this society will be held at the Midland Hotel, Manchester, on Friday, Oct. 3rd, at 7.30 P.M.

Medical Society of Individual Psychology.

This society, which aims at bringing together those who are particularly interested in the medical aspects, both theoretical and practical, of individual psychology, will in future meet at the rooms of the Medical Society of London, Chandos-street, W.

Modern Churchmen's Conference.

Among the papers read at this conference, which was held this week at Oxford, the Dean of St. Paul's presiding, were Principles of Sexual Conduct, by Dr. Douglas White; the Influence of Birth Control on Individual and Racial Health, by Mr. C. J. Bond, F.R.C.S., and Eugenics and Population, by Prof. F. A. E. Crew.

People's League of Health.

The 1930 Travelling Scholarship in connexion with the annual series of Sims Woodhead Memorial Educational Health Lectures given by the People's League of Health was won by Mr. A. Hounslow, a first-year medical student of University College, London. Mr. Hounslow will visit the Pasteur Institute in Paris and Dr. Rollier's clinics at Leysin.

Paddington Medical Society.

At the usual monthly meeting, held in the Great Western Hotel on August 12th, the President, Dr. De Swietochowski being in the chair, an address was delivered by Dr. A. Welply, secretary of the Medical Practitioners' Union, entitled "Past, Present, and Future of Medical Practice," in which he described the changes which had taken place within the last 20 years and the various factors which affect the work and position of the practitioner to-day.

University College Hospital.

Last year this hospital treated 8374 in-patients, whos average stay was 21 days; they cost £10 9*s.* 7*d.* eacl There were 77,129 new out-patients whose cost was 5*s.* 4*d* per head. The income—£113,929—exceeded expenditur by more than £10,000.

Manchester Royal Infirmary Old Residents' Club.

The triennial dinner will be held on Oct. 25th. An former residents who have not received notices are aske to communicate with the secretary of the club at the Roya Infirmary, Manchester.

Hospitals as Companies.

The Liverpool Hospital for Consumption and Disease of the Chest has been registered as a company limited b guarantee. The Royal South London Ophthalmic Hospit has been similarly registered.

High Wycombe War Memorial Hospital.

This hospital is to be enlarged by the addition of 23 bed bringing up the total number to 55, and a children's wa is to be provided.

St. Mark's Hospital.

The annual report of St. Mark's Hospital for Cance Fistula, and Kindred Diseases, City-road, states that la year there were 806 in-patients and 1804 new out-patient Miss Florence Clarke gave £1200 for radium, of whic excellent use has been made, and the results of the trea ment are receiving intensive study.

Enlargement of Croydon Hospital.

Two wards are to be extended to accommodate 44 add tional beds, and provision is also to be made for 17 "pa beds." Three houses at the rear of the hospital are to reconstructed as the Charles Heath Clark Memorial Nurse Home with a grant from Mr. Clark's executors.

Torbay Hospital Chapel.

A memorial chapel, which has been added to th hospital at the cost of Mrs. Rowcroft, was dedicated la week by the Bishop of Exeter.

Sidmouth Cottage Hospital.

Last week the foundations of an extension of this hospit were laid by Mrs. Balfour, wife of Colonel Balfour, who ga the site of the present building. The population of Si mouth has doubled since the hospital was enlarged in 191 and the number of beds is now being increased from 14 to at a cost of £14,000.

Carlisle as a Medical Centre.

Lord Howard of Penrith recently opened two new war of the Cumberland Infirmary at Carlisle. The Balfo Paul Ward, which commemorates the late Mr. C. Balfo Paul, hon. surgeon to the infirmary, and cost £4600, w given by members of his family; the Woodside War which cost £5000, is the gift of Mr. Andrew Gibson. The additions, with a pathological department, nearly comple an extension scheme costing £55,000, the whole of whi has been provided. In a speech at the opening ceremo Dr. Norman Maclaren said that although money w difficult to get, he hoped that the Cumberland Infirma would presently be able to form a training centre. T hospital already has a successful nursing school, and had met nurses trained there in India and on the Weste front. He hoped they would have a school to whi medical men in the district, and probably from beyond would go to see the work done in the infirmary.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2 2 0
	Six Months	1 1 0
	Three Months	0 10 6
ABROAD	One Year	2 10 0
	Six Months	1 5 0
	Three Months	0 12 6

For complete scale of advertisement charges apply THE MANAGER.

Appointments

HERIDGE, C. E., M.B. Lond., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer of Health, Whitstable.

ALKER, R. N., M.B., Ch.B. Glasg., D.P.H., Medical Officer of Health, Stirling.

stminster Hospital Medical School: MINDLINE, J., L.R.C.P. Lond., M.R.C.S., and KOKIA, M., L.R.C.P. Lond., M.R.C.S., Resident House Surgeons; GLOVER, R. McN., L.R.C.P. Lond., M.R.C.S., and ROBERTS, C. G., L.R.C.P. Lond., M.R.C.S., Resident House Physicians.

Vacancies

For further information refer to the advertisement columns.

ert Dock Hospital, Connaught-road.—M.O. At rate of £110.
hton-under-Lyne District Infirmary.—H.S. At rate of £150.
rnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
th, Royal United Hospital.—Asst. H.S. At rate of £120.
kenhead County Borough Infirmary, Tranmere.—Res. Asst. M.O. £350.
kenhead General Hospital.—H.P. Also Cas. O. Each at rate of £100.
ckburn Royal Infirmary.—3rd and 4th H.S.'s. £175 and £150 respectively.
tle General Hospital.—Sen. Res. M.O. Also Jun. H.S. At rate of £200 and £150 respectively.
ghton, Royal Sussex County Hospital.—Cas. H.S. £120.
rdiff City Mental Hospital, Whitchurch.—Post-Graduate Research Studentship. £100.
shire County Council.—Deputy County M.O.H. £1000.
ster Royal Infirmary.—H.P. and H.S. Each £150.
sterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100–£175.
y of London Mental Hospital, near Dartford, Kent.—Jun. M.O. £400.
ventry and Warwickshire Hospital.—Res. H.P. Also Res. Cas. O. £160 and £125 respectively.
rby, Derbyshire Hospital for Sick Children.—Res. M.O. At rate of £150.
rby, Derbyshire Hospital for Women.—H.S. At rate of £150.
rby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.
ugwall, County of Ross and Cromarty.—Two Asst. M.O.H.'s. £700 and £500 respectively.
rchester, Dorset County Hospital.—H.S. £160.
adnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.
dley, Guest Hospital.—Asst. H.S. £160.
rham County Council.—Asst. Welfare M.O. £500.
stbourne, Princess Alice Memorial Hospital.—H.S. At rate of £100.
tcote, Middlesex, St. Vincent's Orthopædic Hospital.—Res. M.O. At rate of £150.
inburgh, Jordanburn Nerve Hospital, Morningside Park.—Asst. Phys. £400.
linа Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
ucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. At rate of £150.
at Yarmouth General Hospital.—Sen. and Jun. H.S.'s. £150 and £140 respectively.
lifax Royal Infirmary.—3rd H.S. £125.
spital for Tropical Diseases, Endsleigh-gardens, W.C.—Two H.P.'s. Each at rate of £150.
stel of St. Luke, 14, Fitzroy-square, W.—Res. M.O. £200.
ll Royal Infirmary.—Hon. Physician.
ntingdon County Hospital.—H.S. £125.
wich, East Suffolk and Ipswich Hospital.—Cas. O. £150 Also H.S. At rate of £120.
ds General Infirmary.—Hon. Gynæcologist.
ds, Herzl-Moser Hospital.—R.M.O. £100.
cester Royal Infirmary.—H.S.'s and Cas. O. Each £125.
erpool, David Lewis Northern Hospital.—Asst. Anæsthetist. £75.
erpool Eye and Ear Infirmary, Myrtle-street.—Hon. Asst. S. to Ear, Nose, and Throat Dept.
erpool Open Air Hospital for Children, Leasowe.—Jun. Res. M.O. £200.
erpool, Royal Liverpool Babies' Hospital, Woolton.—Res. M.O. At rate of £90.
erpool, Walton Hospital, Mill-road Infirmary, Smithdown-road Institution, and Alder Hey Children's Hospital.—Res. Asst. M.O.'s. Each £200.
don Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.
don Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200. Also Two Surg. Regs. Each £100.
nchester Joint Committee on Cancer Research.—Asst. in Cancer Research Laboratories. £400–£650.
nchester, Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s. At rate of £150.
nchester, Royal Children's Hospital, Pendlebury.—Res. M.O. and Res. Surg. O. At rate of £125.
rthyr General Hospital.—Res. H.S. At rate of £150.
ddlesex Hospital, W.—Medical Men interested in Radium Treatment of Malignant Disease. Also Dental H.S.
ddlesex Hospital, Barnato Joel Laboratories.—Asst. in Radiological Research. £350.
ller General Hospital.—Cas. O. £150.
tional Hospital for Diseases of Heart, Westmoreland-street.—Res. M.O. Also Out-patient M.O. At rate of £150 and £125 respectively.
Newcastle-upon-Tyne, Royal Victoria Infirmary, Pathological Dept.—Bio-chemist. £450.
Northampton General Hospital.—H.P., Two H.S.'s, and Two Asst. H.S.'s. All at rate of £150.
Northern Ireland Government.—M.O. £800.
Nottingham General Hospital.—2nd Cas. O. At rate of £150.
Preston and County of Lancaster Royal Infirmary.—Two H.S.'s. Each at rate of £150.
Putney Hospital, Lower Common, Putney, S.W.—Res. M.O. At rate of £150.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—District Res. M.O., Asst. Res. M.O. Also Res. Anæsthetist. Each at rate of £80.
Queen's Hospital for Children, Hackney-road, E.—Cas. O. At rate of £100.
Royal Chest Hospital, City-road, E.C.—Part-time Temporary Pathologist. At rate of £300.
Royal National Orthopædic Hospital.—H.S. At rate of £150.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.
Southampton, Royal South Hants and Southampton Hospital.—Two Asst. H.S.'s. Each at rate of £180.
South-Eastern Hospital for Children, Sydenham.—Hon. Asst. Phys.
South London Hospital for Women, Clapham Common, S.W.—Clin. Asst. to Out-patients.
South Shields, Ingham Infirmary.—Jun. H.S. £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Asst. H.P. £125.
Swansea County Borough, Infectious Diseases Hospital.—Res. M.O. £350.
Swansea Hospital.—H.S. £150.
Taunton, Taunton and Somerset Hospital.—Sen. H.S. and H.P. At rate of £150 and £100 respectively.
Tilbury Hospital, Essex.—H.S. At rate of £150.
Uxbridge, Middlesex, Hillingdon Institution.—Res. M.O. £600.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.S. At rate of £100.
Walsall, Manor Hospital.—Res. Asst. M.O.'s. £200 and £150 respectively.
West Bromwich and District General Hospital.—H.P. and Cas. H.S. Each at rate of £200.
West London Hospital, Hammersmith-road, W.—H.P., Two H.S.'s., and Res. Anæsthetist. Each at rate of £100.
York County Hospital.—H.P. £150.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Crewkerne (Somerset) and Basingstoke (Hants).

Births, Marriages, and Deaths

BIRTHS.

BARLING.—On Aug. 15th, at Garston-avenue, Newton Abbot, the wife of Dr. Ivan Barling, of a son.

BEATH.—On Aug. 12th, at Elmwood, University-terrace, Belfast, the wife of Dr. R. Maitland Beath, of a daughter.

YATES.—On Aug. 16th, the wife of Dr. Henry Yates, of Alton, Hants, of a son.

MARRIAGES.

GREIG—STUART FERGUS.—On Aug. 9th, at the Chapel of the Savoy, Lieut.-Col. Alexander Greig, B.A., B.Chir. Camb., I.M.S. (Ret.), Palace Gate, London, to Nancie Stuart Fergus, daughter of the late W. S. Fergus, Solicitor, Glasgow, and Queen's-gardens, W.

JEAFFRESON—BUNTING.—On Aug. 9th, at St. Mark's Church, Sheffield, Bryan Leslie Jeaffreson, M.D., F.R.C.S., to Margaret Clarice, elder daughter of Mr. and Mrs. A. W. Bunting, of Crimicar-lane, Fulwood, Sheffield.

DEATHS.

BOSTOCK.—On Aug. 12th, suddenly, at The Priory, Burford, Oxon, John Southey Bostock, Colonel, late R.A.M.C., Commandant Royal Army Military College, Millbank, C.B.E., M.B., Ch.B., aged 55.

CHILD.—On Aug. 11th, Gerald Alfred Child, M.R.C.S. Eng., L.R.C.P. Lond., O.B.E., of Hythe, Southampton, aged 59.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I., 1930.

THE Index and Title-page to Vol. I., 1930, which was completed with the issue of June 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NOTES, COMMENTS, AND ABSTRACTS

PREVENTIVE MEDICAL EXAMINATIONS IN INDUSTRY

AND ORGANISED MEDICAL PRACTICE.

By Dr. René Sand,

TECHNICAL COUNSELLOR OF THE LEAGUE OF RED CROSS SOCIETIES (PARIS).

PREVENTIVE medical examinations were introduced first in the army and navy, to be extended later to various schools and to the colonial civil service. Twenty or thirty years ago, however, many industrial and business concerns had already a medical service intended mainly for the emergency treatment of accidents. The popular campaign against tuberculosis roused some employers to a realisation of the danger of contagion in offices or workshops. They asked their medical service to investigate the matter; to their great surprise, numerous cases of open tuberculosis were detected in their staffs. Evidently, the only remedy for this situation was to submit every applicant for a job to a routine medical examination. This practice was found to have other advantages: it did away with the hiring of people physically incapable of working regularly; it enabled the management to assign every one to a job for which he was fit; it prevented representing old-standing disabilities—a hernia, for instance—as the result of an industrial accident, for which compensation was claimed; it gave the examining physician an opportunity to extend valuable health advice to applicants.

USES OF THE PREVENTIVE EXAMINATION.

As a rule, the results of these preventive medical examinations proved excellent; the labour turnover, the removal from one job to another, the time lost for sickness, the accidents, the wastage of goods, all diminished in a striking proportion. It became evident that preventive medical examinations save money to the employer, and that a good medical service is one of the elements of industrial efficiency. At the same time, these examinations helped the employee in preventing him from wasting his health in a job to which he was physically unequal, and in giving him an opportunity for treatment of existing handicaps.

In order to be really useful to the applicant, these examinations must be thorough; they call for the help of specialists, of X rays, of laboratory procedures. In this form they are becoming popular among all classes in the United States, where the Life Extension Institute, a non-profit yet self-supporting institution, has already made more than a million preventive examinations. Life insurance companies offer these examinations free to their policy-holders. Those who take these examinations show such diminished death-rates that the insurance companies gain two dollars for every dollar they pay to the Life Extension Institute, thus making a net profit equal to the expense they have incurred. Here we have the material proof that preventive medical examinations pay in supplementary years of life, health, and efficiency much more than they cost.

However, a man who has been found fit at a first examination may later fail in health. This led some firms to introduce an annual medical examination of their staff. We have thus three degrees in the health supervision of the employees: the summary medical examination, the thorough medical examination, and the annual or periodical examination. Of course, the first is the most usual, as it takes less time and is less expensive. With a good medical organisation it can be done in ten minutes, and is said to cost between one and two dollars in the United States. A thorough medical examination tal half an hour, and costs between 10 and 20 dollars.

DOUBTS AND FEARS.

Some workmen have feared that these examinatic would be used as a pretext to eliminate trade-uni leaders or people known for their radical opinio I am told that this has actually happened; it mu however, remain very exceptional. One har imagines that a manager who is farsighted enou to spend a considerable sum of money in medi examinations of his staff should use them in a w which must lead rapidly to their discredit. Anotl more serious objection is that this procedure mal life very hard for the handicapped, and practica throws them on public or private relief. These peo surely deserve our consideration. But, first of the examination is not conducted with the idea f eliminating everyone who is not in the best of healt it is merely made the basis of a job-selection wh enables an employer to accept many of the han capped. Those who are rejected are either contagi cases or people who could not undertake any regu work; if accepted, they would soon exhaust th remaining strength or incur accidents. Indus is not responsible for this situation, and the rem is not to hire for a few days or a few weeks a m who will soon have to give up work, but rather provide for him through an insurance scheme.

PREVALENCE OF ILL-HEALTH.

These examinations, whether made in indust circles or among the general population, bring light the rather sad fact that almost no one is complet healthy. Less than half of the people who beli themselves fit enjoy normal weight and nor posture. Less than half have normal eyesight. L than half have a normal throat and nose. Less th half have normal teeth. Forty per cent. suffer fr constipation. Luckily, 80 per cent. have a sou heart, good ventilated lungs, permeable kidne These statistics show that preventive medical exami tions have a twofold use; in a certain number of ca they lead to the discovery of unsuspected and seri troubles which can then be adequately treated; the majority of cases they reveal minor trou which, while they do not imperil the life of the subj nevertheless diminish his vitality and reduce efficiency. The correction of these troubles p the subject in a state of well-being from which he h been disaccustomed for years. Experience pro that one year after the first preventive examinat three out of ten defects are corrected; a sec medical examination leads to the correction of th further defects. This is interesting from individual's point of view, but even more so fr the point of view of the community. Mr. Ho Folks and others have reckoned that disease co the American nation 15 per cent. of its yearly inco It is admitted, however, that at least one-third the diseases prevalent to-day are preventable. T national income could thus be increased by 5 cent.

PREVENTIVE MEDICINE FOR ALL.

At this point one will inevitably ask: if th examinations are so valuable, why should they the privilege of clerks and workers in a limited num of concerns? Why does not every practitio examine in this way each member of the fami which call him when sick?

The reason is that medical practice has not adjusted itself to the progress of our knowledge. long ago medicine was more an art than a scien Contact with patients developed in the docto clinical sense which was almost his only resou His therapy was limited and often perfunct Seeing patients belonging to various walks of he could not trace the social elements which are

ep causes of disease; at any rate, he could not fluence them. Hygiene and preventive medicine ere still in their infancy. All that is changed to-day; edicine becomes more and more of a science, calling r complicated equipment, for laboratory procedures, d for the help of various specialists. The social orkers inform the doctor about the social causes diseases and try to remove these causes. The vance of hygiene and preventive medicine puts the hands of the physician effective weapons to otect and develop the health of the people.

But the practice of a profession cannot be transrmed easily or quickly. To change one's methods, to apt oneself to a new machinery, to create these new ethods and this new machinery, necessitates a huge ort and represents a serious risk. No profession as ever more individualistic than the medical profesn. Since its origin patient and doctor have been ne face to face. And now circumstances compel actitioners to work in teams; in the mutual benefit cieties, in health insurance practice, in the industrial edical services, in the school medical services, the child welfare services, in the tuberculosis, nereal disease, and mental hygiene dispensaries, ey have to accept new formulas, to do collective rk, to make themselves responsible to non-medical thorities; they have to coöperate with nurses and cial workers; they have, in the homes themselves, t only to cure but to prevent.

ISOLATED VERSUS ORGANISED PRACTICE.

Which profession has ever undergone a greater nsformation? Yet it is inevitable. Not that e family doctor is to disappear; on the contrary. ere exists no greater asset for the patient. The nflict lies between the *isolated* and the *organised* actice of medicine and it is the repetition, in another ld, of the conflict between artisan and big industry, tween the small shop and the great store. There ll remain isolated practitioners, just as there remain tisans and small shops. But organised practice ll take on increasing importance, it will attract e better elements of the profession, because it more efficient, more interesting, more scientific. d it is not less dignified or less lucrative. Some ysicians fear for their independence; is the isolated actitioner really independent? He has not one ster, he has a thousand. He will have to write ords, statistics, reports. Is it possible to treat atient efficiently without a record? Is it possible to mpare therapeutic procedures without statistics? alth accounts need figures and books just as bank counts. And if the doctor does his work conscienusly why should he fear inspection?

This organised practice is the kind of medicine ny of us have known in the war hospitals, and we en regret that in our isolation we are deprived the facilities we enjoyed for the treatment of the diers. It is also the best means to avoid the faults ich have been ascribed to insurance schemes. e would not hear of a "diagnosis and a prescription a minute" if the doctors worked in teams.

As regards the economic situation of the profession, m which many complain, raising our fees is not e solution. Let us see things as a whole; the tion pays each year a certain sum to the medical ofession, from private purses, from insurance funds, m public funds. To raise this sum we have to do the business man who wants to increase his sales. e does not raise the price of his wares. He tries reduce his overhead expenses, to improve his oduction, to turn out better commodities, to spread eir use; in a word, to serve the public better and to ch more people. It is exactly what the medical ofession ought to do. If the practitioners worked teams they would reduce their overhead expenses rent, heating, light, equipment, service; they would prove their work—think of all these tuberculous, acerous, arterio-sclerotic people whose illness is gnosed too late and treated with antiquated thods; think of this huge preventive work ich ought to preserve much more completely than is done to-day the pregnant women, the babies, the pre-school children, the school-children, the apprentices, and the adults. There is the "better commodity" which we ought to "sell" to the public. We can be sure that he will want it and be ready to pay for it. Then we will not hear any more complaints about "medical plethora"; if each man, woman, or child in England, for instance, underwent a yearly preventive medical examination and paid for it one pound—public authorities stepping in for those who are unable to spend this sum for their health—that would mean, divided equally, an income of nearly £1000 for every practitioner.

Of course, there is a long way to go before we reach that state, but is it not evident that preventive medicine is still too much neglected by our profession to our detriment, as well as to the detriment of the population? Preventive medicine necessitates teamwork, and cannot develop as long as we shut ourselves up in isolated practice. Thus the dilemma is: to stagnate in the present unsatisfactory condition, or to take a bold step forward and adopt an organised practice, which will be more efficient for the nation and more satisfactory, intellectually and materially for our profession.

THE SOCIAL SERVICE DEPARTMENT OF ST. THOMAS'S HOSPITAL.

THE work of the Social Service Department of the voluntary hospitals continues to increase year by year. It may seem a paradox, but the more State activities develop the more the voluntary hospitals are called upon to do. The annual report of the Social Service Department of St. Thomas's Hospital for 1929 gives a page of figures which, it needs little imagination to realise, must mean many and varied pressing needs. During the year 1537 patients were "convalesced" and of these 155 went to "free" beds and the rest to paying homes at a cost of over £4000, a figure which represents a decrease of cost but an increase of cases for the year. Incidentally, the report states that London has within a radius of a few hundred miles a better supply of convalescent homes than any other place in the world, and yet more homes for children, especially for medical cases, are needed. Children living under bad hygienic conditions respond more quickly to the surroundings of a convalescent home than any other type of case. The number of cases for whom home visits were paid by the Social Service workers of the hospital reached last year the total of 6417, of which more than half were in respect of out-patients and casualty cases. Accounts are given of 15 different departments of the hospital's activities ranging from new and rapidly growing departments, such as the mental department, where the early cases give much scope for social work, to the tuberculosis department where the State services have come to play such a large part, and yet still leave room for much voluntary effort. With the number of unemployed growing at an alarming rate social service work is full of difficulties these days. What effect the new Local Government Act and the public assistance committees will have on this side of the voluntary hospitals' work nobody can yet tell, but there is every reason to believe that the almoner's work will be increased rather than diminished.

A NEW WRAPPER FOR MEDICINE BOTTLES.

Messrs. H. Young, Myers and Co., of Astor House, Aldwych, London, W.C., have sent us samples of a neat container for medicine bottles. It consists of a paper bag so constructed that it lies flat while being addressed and readily expands when the bottle is being inserted. The bags are made in sizes to suit standard bottles of 6, 8, or 12 oz., and are much more convenient than the envelope or sheet of paper ordinarily used. They are firm, neatly finished, and inexpensive.

CLOTHING FOR WOMEN IN THE TROPICS.

FIRMS employing workers in the tropics usually provide a schedule of suitable equipment for the men who are going there, but the women are usually forgotten and have to rely on private advice. Even experienced tropical outfitters are rarely prepared with lists for women who propose to spend more than a brief time in the tropics. They are, therefore, apt to follow English summer fashions and to find that they are very inadequately fitted out. Dr. J. B. Christopherson [1] holds that feminine dress reform is an urgent need, for in his view the reasons why women do not survive tropical life are: the lack of preliminary medical examination, the lack of any useful occupation, and the unsuitable clothes worn by them. Dr. Christopherson urges women to wear exactly the same clothes as men: trousers, Jodhpurs, or plus-fours, with puttees, together with a tunic or smock. The evening dress suitable for this country is an invitation to the mosquito, and should always be supplemented by mosquito boots reaching above the knee, or by cashmere stockings under the silk, and the arms and neck should be protected. In the matter of underclothing women going to the tropics should seek the advice of expert outfitters used to supplying men. Wool, cashmere, silk, artificial silk, cotton, lawn, cellular material, mercerised cotton, and linen all have their place, but the wearer should be guided in their use in different areas and on different occasions by those with experience of the climate and entomological conditions of the district. Colour, texture, fabric, and style must all vary with varying conditions, and there is still room for research into the attraction of certain colours for certain insects; the relation of colours to light and heat and of fabrics to absorption, reflection and the conduction of heat and moisture.

NEW PREPARATIONS.

DRY OINTMENTS.—The selection of a suitable base for the incorporation of an active remedial drug is of great importance in the treatment of skin diseases, and does not always receive the consideration it deserves. Thus one frequently sees acute septic conditions treated with ointments, and lotions applied to a dermatosis resulting from an inherent lack of secretion from the sebaceous glands (xerodermia). The claims put forward by the manufacturers of HEKOTEKT (sole concessionaires: E. L. Fry and Co., 3, Pancras-lane, E.C. 4), a base compounded largely from "condensed skimmed milk," cannot, however, be accepted in their entirety. The casein constituent is not a new departure and has been embodied in many proprietary creams in this and other countries for years. Nor can it take the place of lotions in many of the more acute and weeping varieties of dermatitis, for a cooling and sedative effect cannot be obtained otherwise than by lotions. Hekotekt dry ointments deserve praise for convenience in application, for homogeneity, and for cleanliness; but the scope of their indications in skilled hands falls considerably short of those put forward by the manufacturers, while the combinations with drugs—such as sulphur, tar, zinc, resorcin, and chrysarobin—have the grave disadvantage of fixed percentages, which cannot be altered or modified to suit the individual patient. The preparations, while doubtless of value in selected cases, should not be used haphazard or without due consideration of the particular needs of any case in which their employment is contemplated.

COLACTIN.—The proprietors of Colactin (E. H. Spicer and Co., Ltd., Watford, Herts) state, as the main argument for its preparation, that milk sugar administered by the mouth rarely reaches the colon, and is therefore of so much the less value in modifying the intestinal flora. This preparation, cacao-oleum-lactin, is an effective suspension of lactose in mineral oil; it is lubricant of the intestinal wall and the emulsion protects the lactose (40 per cent. by weight) from digestion in the small intestine. There is medical evidence that persons with widely differing symptoms of alimentary toxæmia have benefited by the use of this simple remedy. The suggested dosage for adults is from half to one tablespoonful without addition of liquid before breakfast and upon retiring, while one or two teaspoonfuls make a sufficient dose for children. The proprietors call attention to the particularly good results that have followed certain cases where the taking of their B. Acidophilus Emulsion has been combined with the exhibition of Colactin.

[1] Jour. Trop. Med. and Hyg., 1930, xxxiii., 201.

NURSING IN THE U.S.A.[1]

PERUSAL of a small volume recently issued in America conveys the impression that nursing in the United States is in some directions a more fortunate calling than it appears to be in this country just now, for it would seem that the money-making possibilities of nursing have been advertised in America to an extent under which the avocation has suffered, inasmuch as when the question of earning a living has confronted an increasing number of girls the lucrative opportunities of nursing have proved persuasive to the wrong kind of entrants. There is no temptation of this sort for nurses on our side of the Atlantic, a point which does not need emphasising. It appears also that nurses in America are subjected to the kind of public flattery which, if the pages of mid-Victorian novels can be trusted, fell formerly to the lot of nurses in this country—namely, that they were called by the public "angels of mercy." This attitude towards nurses Miss Gladwin shows to be extremely distasteful to her, as well as to represent a complete misapprehension of values. She lays stress on the necessity for gentleness, kindness, and intelligent sympathy, but these qualifications must fall clearly into line with such other qualities as power of observation, respect for discipline, and the exhibition of good manners if the true efficiency of service is to be obtained.

Those who read this wise little book should remember that it is addressed not to the public but to an audience of young women adequately, but not—at any rate, generally—in the least highly educated, so that certain passages or whole essays in which the obvious appears to be unduly stressed must not be regarded as exercises in claptrap; they represent sound teaching, but in simple words for the benefit of those who may never have had formal instruction upon the fundamental tenets of social behaviour.

[1] Ethics Talks to Nurses. By Mary E. Gladwin. London: W. B. Saunders Company. 1930. Pp. 281. 8s. 6d.

A. W. F.—With reference to the depreciation of doctors' motor-cars from the point of view of income-tax, in 1925 the Government extended the wear-and-tear allowance on motor vehicles to members of the medical profession; whilst 20 per cent. upon the written down figure has been accepted (the amount to be allowed always being at the discretion of the Commissioners), the figure now generally accepted is 15 per cent. If, however, such a figure is not considered sufficient in any particular case, the Commissioners may, upon satisfactory evidence being placed before them, make such allowance as is fair and just. In the Tax Supplement of the *Accountant*, dated March 30th, 1929, a full list of wear-and-tear allowances for income-tax purposes is given, and in the issues of the same journal dated August 10th and 17th, 1929 (pp. 350 and 358 of the Tax Supplement), space is given to correspondence on the subject.

A NEW INFIRMARY AT DEWSBURY.—The work of the Dewsbury and District General Infirmary is this week being transferred to the new building on the Mirfields Estate, overlooking the town, the old building having been sold to the corporation. There are 97 beds and a new nurses' home. The cost, which was estimated at £130,000, is now expected to reach £150,000.

STUDENTS' GUIDE—SESSION 1930-1931

THE GENERAL MEDICAL COUNCIL.

POWERS, DUTIES, AND CONSTITUTION.

THE General Council of Medical Education and Registration of the United Kingdom is, first, a registering body: no person, even though his qualifications have been obtained by examination, is a *legally qualified* medical practitioner until his name appears in the Medical Register. Secondly, it is a standard-ing body, ensuring that medical education reaches an efficient minimum standard by scientific examination. Thirdly, it is a penal and disciplinary body, having power to remove from the Register any practitioner convicted of felony or misdemeanour or adjudged guilty of professional misconduct. Fourthly, to the Council is committed the codification of pharmaceutical remedies. The duties of the Council are thus primarily of a public nature, and its construction shows its fitness for its fourfold responsibilities.

The Council consists of 38 members, of whom all but 11 are official representatives of some corporate body. Five members are chosen by the Crown on the advice of the Privy Council, and six others are elected by the members of the medical profession as Direct Representatives. The Crown members need not be medical men and one layman now sits on the Council. Three members are appointed for dental business by the Privy Council under the Dentists Act, 1921, under which the powers and duties of the General Medical Council with regard to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the Dental Board of the United Kingdom.

The Educational Curriculum.

Professional Education.—The course of professional study after registration as a student occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

REGULATIONS AS TO REGISTRATION OF MEDICAL STUDENTS.

Before registration as a student every candidate should produce evidence that (*a*) he has attained the age of 17 years; (*b*) that he has passed a recognised examination in general education; and (*c*) that, *in addition thereto*, he has passed, or obtained exemption from, an examination, theoretical and practical, in elementary physics and elementary chemistry conducted or recognised by a licensing body. The minimum standard of General Education required is that of University Matriculation or Entrance examination in the Faculties of Arts or Pure Science. In other Faculties the examination must be of the standard prescribed in Regulation 2 below.

An approved course of instruction in elementary biology at a secondary school or other teaching institution recognised by a licensing body may admit a student to the professional examination in elementary biology upon registration as a medical student. The student should in every case write beforehand to the Body whose qualification he desires to obtain, and, although it is not necessary to pass in Biology before registration as a student, application should be made at the same time to the Body selected to ascertain their requirements in regard to this subject.

The candidate commencing medical study should apply to the registrar of the division of Great Britain and Ireland in which he is residing, according to a prescribed form, copies of which may be had on application to the several licensing bodies, medical schools, and hospitals, or at the offices of the Council; and should produce proof that he, or she, has fulfilled the first three conditions.

MAINTENANCE OF REGISTER OF MEDICAL STUDENTS.

1. The Education Committee prepares and issues from time to time a list of examining bodies whose examinations in general education fulfil the conditions of, and are specially recognised by, the Council.

2. The Council has recognised the undernoted university examinations which are conducted in Great Britain and admit to the Faculties of Arts or Pure Science, or to other Faculties, subject to the conditions specified below:—

Oxford University, Responsions; Cambridge University, The Previous Examination. The Matriculation Examinations of the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Victoria of Manchester, Sheffield and Wales, and the Entrance or Preliminary Examination of the Universities of Scotland.

The condition prescribed by the Council in Faculties other than Arts or Pure Science is that:—

The certificate shall bear evidence that the candidate has passed in the Matriculation or Entrance standard, in the following subjects, viz.: (*a*) English. (*b*) Mathematics, Elementary. (*c*) A language other than English. (*d*) A fourth subject, as defined in the regulations of the particular Examination, to be chosen from the subjoined list, viz.: History, Geography, Physical Science, Natural Science; Botany, Latin, Greek, Hebrew, French, German, or other language accepted by the University for the purpose of matriculation or entrance.

3. Subject to the condition prescribed above (Section 2), the Council will recognise those of the examinations conducted by recognised authorities in Great Britain which are accepted by any one or more of the above-named Universities as equivalent (under prescribed conditions as to "credits" or "grades"), for purposes of Entrance or Matriculation, to an Examination named in the preceding list (Section 2). In School or Leaving Certificates, the four required subjects must have been obtained at not more than *two* sittings. Such Examinations are:—

Bristol University: Higher School Certificate Examination; School Certificate Examination. Cambridge Local Examinations Syndicate: Higher School Certificate Examination; School Certificate Examination. Central Welsh Examination Board: Higher Certificate Examination; School Certificate Examination. Durham University: Higher Certificate Examination; School Certificate Examination. London University: Higher School Certificate Examination; General School Examination. Northern Universities Joint Matriculation Board: Higher Certificate Examination; School Certificate Examination. Oxford and Cambridge Schools Examination Board: Higher Certificate Examination; School Certificate Examination. Oxford Delegacy for Local Examinations: Higher School Certificate Examination; School Certificate Examination. Scottish Education Department: Leaving Certificate Examination.

4. The Council will continue to recognise certain Examinations conducted by Educational Bodies, other than those (mentioned in Section 3) whose Examinations are accepted by any one or more of the Universities of Great Britain. Recognition will not be extended under this Section to any Examination unless the Council is satisfied (*a*) that in scope and standard it is equivalent to a recognised Matriculation or Entrance Examination of a University of Great Britain, (*b*) that it fulfils the condition prescribed by the Council (Section 2), and (*c*) that the Examination has been completed at not more than two sittings. Such Examinations are:—

The College of Preceptors (England): Senior Certificate (with *credit*). The Educational Institute of Scotland: Preliminary Medical Certificate.

5. Subject to the prescribed condition (Section 2), the Council will recognise the Entrance Examination to the School of Physic of the University of Dublin, and the Matriculation or Entrance Examinations of the National University of Ireland, the Queen's University of Belfast, the Irish Royal Colleges of Physicians and Surgeons; and also the Senior Grade or Leaving

Certificate of the Department of Education of the Irish Free State, the Senior Certificate Examination of the Ministry of Education of Northern Ireland, and all examinations accepted by any one or more of the Universities of Great Britain or Ireland. as equivalent, for purposes of entrance or matriculation, to the above-named University Examinations.

6. Subject to the prescribed condition (Section 2), the Council will recognise all Examinations of Colonial or Foreign Universities which are accepted by any one or more of the Universities of Great Britain as equivalent, for purposes of entrance or matriculation, to an examination named in the list of examinations recognised by the Council (Section 2).

7. The Council will recognise the Final Examinations for Degrees in Arts or Science of any University of Great Britain or Ireland or of the British Dominions.

8. The registration of medical students shall be placed under the charge of the Branch Registrars.

9. Each of the Branch Registrars shall keep a register of medical students.

10. The Branch Registrar shall enter the student's name and particulars in the Students Register, and give him a certificate of such registration.

11. Each of the Branch Registrars shall supply to the several licensing bodies, medical schools, and hospitals, in that part of Great Britain or Ireland of which he is Registrar, blank forms of application for the registration of medical students.

12. A copy of the Medical Students Register prepared by each of the Branch Registrars shall be transmitted, on or before Dec. 31st in each year, to the Registrar of the General Council, who will distribute the list to the licensing bodies, medical schools, and hospitals.

All applications for special exceptions to the foregoing regulations as to registration shall be addressed to the Registrar of the General Council, and shall be decided by authority of the Education Committee, who shall report thereon to the Council.

MEDICAL SCHOOLS AND COLLEGES.

The Universities, including their Colleges and Medical Schools, and Schools of Medicine at which Medical Study may be commenced in the United Kingdom are set out seriatim in the following pages.

Medical Registration in Ireland.

By agreement between the Governments of Great Britain, of the Irish Free State, and of Northern Ireland — since confirmed by legislature at Westminster and Dublin—the powers and duties of the General Council of Medical Registration and Education are continued as heretofore in respect of qualifying bodies in the Irish Free State, and of medical practitioners qualified in the Irish Free State. Side by side with this a Medical Council has been set up in the Irish Free State with the duty of establishing and controlling a Register for the Irish Free State. Practitioners whose names are on the General Register, and persons who pass a qualifying examination in the Irish Free State, will be registered on the Irish Free State Register on payment of the prescribed fee. The Irish Free State Medical Council have, over those whose names are on the Irish Free State Register, the same disciplinary powers as are possessed by the General Council over those whose names are on the General Register. To possess the privileges of a qualified practitioner in the Irish Free State it is necessary to be registered in the Irish Free State Register.

The net result of the change in the law as regards the practitioner qualifying in the Irish Free State in the future is that: (1) If he intends to practise only in the Irish Free State he need only register in the Irish Free State Register; (2) if he intends to practise in Great Britain he will register in the General Register; and (3) if he is in doubt where he will practise he will register in both Registers. He will, as he registers in one Register, or in both Registers, put himself under the disciplinary control of the one Council or of both Councils. No practical inconvenience is caused, and practitioners qualified in the Irish Free State in future will not find themselves deprived of any of the privileges or rights enjoyed by their predecessors.

Dental Board of the United Kingdom.

Anyone who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but it is a distinct advantage to take a special dental qualification, otherwise few dental appointments at general or special hospitals or dispensaries are available, and, unless registered in the Dentists Register, no dental work, under the additional Benefit Scheme of the National Health Insurance Act can be undertaken.

Under the Dentists Act, 1921, the powers and duties of the General Medical Council under the Dentists Act, 1878, and under the Medical Act, 1886, which related to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the then newly constituted Dental Board of the United Kingdom. The registration of dental students at the commencement of their dental studies, and the right of erasure of a name from the Dentists Register, remain with the Council, but the duty of inquiring into disciplinary cases rests with the Board, upon whose recommendations the Council acts.

The Dental Board consists of a chairman and 12 members. The chairman is appointed by the Privy Council. Other members of the Board are appointed by the Minister of Health, the Scottish Board of Health, the Governor-General of Northern Ireland, the General Medical Council (3), Direct Vote of the qualified dentists practising in England and Wales, Scotland, and Ireland (3), Direct Representatives by dentists registered under the Dentists Act, 1921.

REGISTRATION OF DENTAL STUDENTS.

The General Medical Council's Regulations in regard to the registration of dental students which came into force on Jan. 1st, 1923, provide that the registration of dental students shall be carried on at the General Medical Council Office in London, in the same manner as that of medical students, and be subject to the same regulations as regards age and preliminary examinations; but in the case of dental students professional study may commence either at a recognised dental hospital or school, or by pupilage with a registered dental practitioner.

Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months instruction in dental mechanics. It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school. Two years' *bona-fide* apprenticeship with a registered dental practitioner, after registration as a dental student, may be counted as one of the four years of professional study. When a student can show evidence of regular pupilage for not less that two years in dental mechanics to a registered dental practitioner, prior to the passing of the prescribed preliminary and scientific examinations, he may be allowed to antedate his registration for a period not exceeding one year prior to the passing of these examinations.

Offices.

The address of the Registrar, to whom further communications should be addressed, is as follows: The Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W.1. The offices of the Dental Board are adjoining.

A memorandum on the procedure to be adopted by those who desire to enter the profession of medicine, with notes on costs and prospects, and a similar Memorandum in regard to Dentistry, may be obtained on payment of 1*s*. each.

MEDICAL EXAMINING BODIES AND SCHOOLS IN ENGLAND AND WALES.*

UNIVERSITY OF OXFORD.

THERE are two degrees in Medicine, *B.M.* and *D.M.*, wo in Surgery, *B.Ch.* and *M.Ch.*, and diplomas in *Public Health*† and *Ophthalmology*. The examinations re open to men and women alike.

Only Graduates in Arts of the University are eligible or the Medical and Surgical degrees. The most onvenient course for the B.A. degree for intending raduates in Medicine is to take Responsions, the Preliminary Science Examinations mentioned below, nd the Final Honour School of Physiology. To btain the degrees of B.M. and B.Ch. the following xaminations must be passed: 1. Preliminary ubjects: Physics and Chemistry, Zoology, and Botany. 2. Professional. (*a*) First Examination: ubjects—Organic Chemistry, unless the candidate as satisfied the examiners in Part I. Chemistry in he Honour School of Natural Science; Human Physiology, unless he has obtained a First or Second lass in Animal Physiology in the Honour School of Natural Science; Human Anatomy. (*b*) Second Examination: Subjects—Medicine, Surgery, Midwifery, Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology. The First and econd Professional examinations are held in June nd December. The first B.M. examination may be assed at any time after the Preliminary Scientific xaminations. Anatomy and Physiology must be assed at the same time—Organic Chemistry may be aken separately.

At any time after passing *First B.M. Examination*, he candidate can, on producing certificates, present imself for examination in the subjects of Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology; but cannot, unless he is already a egistered medical practitioner, enter for examination n Medicine, Surgery and Midwifery until the eighteenth erm from his matriculation, nor until a period of at east thirty-three months has elapsed from the date f passing the First B.M. Examination. He must ass in Medicine, Surgery and Midwifery at one and he same time.

Before admission to the Examinations in Pathology nd Bacteriology, and Materia Medica and Pharmacology, of the *Second B.M. Examination*, the student ust produce certificates of having attended courses f instruction including practical work in Pathology, Bacteriology, Post-mortem Clerking, Pharmacology, nd Pharmacy, either in Oxford or in a recognised Medical School. Before admission to the remainder of he second B.M. Examination, he must produce a umber of other certificates, including certificates of aving acted as Clinical Clerk and Dresser, each for ix months in the Wards, of instruction in Midwifery nd of attendance on Labours, of instruction in Infectious Diseases and in Ophthalmology, of proficiency in Vaccination and in the administration of Anæsthetics, and of three academic years of hospital practice.

The degree of Bachelor of Surgery (B.Ch.) is granted with that of B.M. after passing the above examinations.

The degree of Doctor of Medicine (D.M.) is granted to Bachelors of Medicine of the University who have entered upon their thirtieth term rom Matriculation, and have submitted a dissertation which is approved by judges appointed for the purpose by the Board of the Faculty of Medicine. The degree of Master of Surgery (M.Ch.) is granted after examination to Bachelors of Surgery who have entered upon heir twenty-first term, and who are members of the urgical staff of a recognised hospital, or have acted as dresser or house surgeon in such a hospital for a period of six months. The examination, which includes Surgery, Surgical Anatomy and Pathology and Surgical Operations, is held annually in June, after the Second B.M. examination.

Travelling Fellowship, Scholarships, and Prizes.—A Radcliffe Travelling Fellowship is awarded annually after an examination held in February. It is tenable for two years and of the annual value of £300. The examination is in Physiology, Pathology, and Hygiene, and is partly "practical." Candidates must be graduates in Medicine of the University. The holder must travel abroad for the purpose of medical study. Application should be made to the Radcliffe Examiners, Department of Medicine, University Museum. A Schorstein Research Fellowship of the value of £200 a year, tenable for two years, is offered in alternate years. Candidates must be graduates of the University, under 35 years of age, and must hold a registrable medical qualification. Their research must be carried out in one of the Medical Departments at Oxford. A Christopher Welch Scholarship of £100, tenable for four years, is awarded annually after examination. Candidates must be men undergraduate members of the University, who have not exceeded the twelfth term from their matriculation, or been admitted to any degree in the University. They may offer any one of the subjects, Animal Physiology, Botany, Zoology. A George Herbert Hunt Travelling Scholarship of the value of about £100 is awarded every second year to enable a Bachelor of Medicine to undertake three months' study abroad. A Rolleston Memorial Prize is awarded once in two years to members of the Universities of Oxford and Cambridge of not more than ten years' standing for an original research in some Biological subject, including Physiology or Pathology. The Radcliffe Prize, founded by University College (1907), is of the value of £50 and is awarded biennially (alternating with the Rolleston Memorial Prize) for research in some branch of medical science. The Theodore Williams Scholarships, each of the value of £50 a year for two years, are awarded annually in the subjects of Anatomy, Physiology, and Pathology. A Radcliffe Scholarship in Pharmacology, of the value of £50 for one year, is awarded annually by the Master and Fellows of University College. A King's College Hospital Burney Yeo Scholarship of £80 is awarded each year on the nomination of the Regius Professor of Medicine. The Scholarships and Exhibitions in Science which are offered by most Colleges are open to those who intend to pursue Medicine. The value of these scholarships varies, according to the candidate's need, between £30 and £100 a year; the exhibitions vary in value from £30 to £100 per annum. The number of scholarships and exhibitions in Science offered annually is about forty. There are also Medical Scholarships of the value of £100 a year at University College and at Pembroke College. The Welsh Memorial Prize for Anatomical drawing is awarded annually, and is of the value of about £10.

More detailed information may be obtained from the University Calendar; from the Examination Statutes, 1929; from the Regius Professor of Medicine; from the Professors in the departments of medical science; and from the Dean of the Medical School, Oxford.

Radcliffe Infirmary and County Hospital.

There are 225 beds. Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) clinical lectures by the Litchfield Lecturers in Medicine and Surgery; (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation; and (4) pathological demonstrations and instruction in post-mortem work are given by the Pathologist. Opportunities are offered to students who wish to act as surgical dressers and clerks. A post-graduate course is held in the hospital in the autumn of each year.

* For special diplomas see p. 490.
† Suspended until further notice.

UNIVERSITY OF CAMBRIDGE.

There are two degrees in Medicine, *M.B.* and *M.D.*, two in Surgery, *B.Chir.* and *M.Chir.*, and Diplomas in *Public Health*, *Hygiene*, *Tropical Medicine* and *Hygiene*, and *Medical Radiology and Electrology*. Students of Girton or Newnham College are admitted to the examinations for these degrees and diplomas.

The student must enter a College, or become a Non-Collegiate student, and keep nine terms (three years) by residence. He must pass the Previous Examination of the University before he comes into residence or therefrom obtain exemption, particulars of which may be obtained from the Registrary. He may then devote himself to medical study in the University. Or he may, as nearly all students now do, proceed to take a degree in Arts by passing the Examinations for the Ordinary B.A. degree, or an Honours degree by passing one or more Tripos Examinations. The Natural Sciences Tripos is taken most frequently by medical students, as some of the subjects are practically the same as those for the First and Second M.B. Examinations.

For the degree of Bachelor of Medicine (*M.B.*) five calendar years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three years are spent in Cambridge till the student has passed the examination for Part I. of the Natural Sciences Tripos and the *First and Second M.B. Examinations*. Hospital practice may be attended at Addenbrooke's Hospital, Cambridge, after the student has passed Parts I. and II. of the *Second Examination*. The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, Psychology, and Public Health are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

There are three examinations for M.B. The *First* includes (1) General and Inorganic Chemistry, (2) Mechanics, (3) Physics, and (4) Elementary Biology. These parts may be taken together or separately. The *Second* is divided into three parts—viz. (1) Organic Chemistry, (2) Human Anatomy and Physiology, and (3) Pharmacology and General Pathology. The *Third* is divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept by the candidate reading an original dissertation composed by himself and being examined orally on some subject approved by the Regius Professor of Physic. Candidates who have passed both parts of the Third M.B. examination are admitted to the registrable degree of Bachelor of Surgery (B Chir). without separate examination and without keeping an Act.

The degree of Doctor of Medicine (M.D.) may be taken three years after that of M.B. or four years after that of M.A. The candidate is required to produce certificates of having been engaged in Medical Study for five calendar years, and if an M.A. to pass the same examinations as are required for the degree of M.B. An Act has to be kept, consisting of an original Thesis with *viva voce* examination; and a short extempore essay has to be written on a topic taken from the general subject of his thesis, whether it be Physiology, Pathology, Pharmacology, the Practice of Medicine, State Medicine, or the History of Medicine.

Candidates for the Degree of Master of Surgery (M.Chir.) who are M.A.'s may be admitted to the examination after they have become legally qualified under the *Medical Acts* to practise surgery. Others may be admitted to the examination when two years at least have elapsed after they have completed all that is required of candidates for the Degree of B.Chir. Candidates are required to pass an examination in Principles and Practice of Surgery, Surgical Anatomy and Surgical Operations, and Pathology, and to write an extempore essay on a Surgical Subject (Proposals are now before the University whereby the examination will be held once a year in February.

Diplomas are granted in Public Health, in Hygiene, in Tropical Medicine and Hygiene, and in Medical Radiology and Electrology. Candidates must hold a recognised medical qualification.

Scholarships and Prizes.—Medical studies are endowed by the numerous Natural Science scholarships at the various colleges, information about which can be obtained from the respective Tutors. There are Natural Science scholarships at most of the Colleges and prizes in the ancillary medical subjects. Some of these are entrance scholarships; some may be gained by students already in residence, and where suitable candidates are not forthcoming among such students the emoluments may be allotted to members of other Colleges. Valuable scholarships instituted on behalf of Medicine are the Tancred Studentships in Physic, tenable at Gonville and Caius College. The successful candidates must enter at the college within a month or remove there if they are members of any other college. Students are required to take the degree of M.B. as soon as they are of sufficient standing but may hold a Studentship for a further three years. Thus a student elected previous to admission to college can draw the emolument, the annual value of which is about £100, for eight years. Full particulars can be obtained from Mr. E. T. Gurdon, 28, Lincoln's Inn-fields, London. Among other scholarships and prizes may be mentioned the Balfour Studentship, for research in Biology, of the value of £300 a year for three years, not restricted to members of the University; the Frank Smart Studentship and Prizes for Botany and Zoology, and the Shuttleworth Studentship for Zoology or Physiology tenable at Gonville and Caius College. The one University prize in Medicine, the Raymond Horton-Smith Prize, is awarded to that candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, provided that he has taken honours in a Tripos Examination.

An abstract of the Regulations and Schedules of the range of the examinations in Chemistry, Mechanics, Physics, Biology, Pharmacology, and General Pathology may be obtained upon application to the Registrary, The Registry, Cambridge.

Addenbrooke's Hospital.

Over 200 beds. Clinical Lectures in Medicine and Surgery, in connexion with Cambridge University Medical School, are given at this hospital twice a week during the academical year; and practical instruction in Medicine and Surgery is given in the wards and out-patients' rooms by the physicians and surgeons daily during the term time and vacations. The fee for pupilship is 3 guineas a term, 9 guineas a year, 12 guineas perpetual. Further information may be obtained from Mr. Vernon Pennell.

UNIVERSITY OF LONDON.

The University of London was constituted in 1836, reconstituted under the Act of Parliament, 1898, as a teaching as well as an examining body, and again reconstituted under Act of Parliament, 1926. All the metropolitan medical schools are constituent colleges while Clinical Units have been established at St. Bartholomew's, the London, St. Mary's St. Thomas', University College Hospital, and the Royal Free.

Internal and External Students.—All the examinations of this University are open to men and women alike. Matriculated students of the University may be either internal or external. Internal students of the University are students who are registered as pursuing a prescribed course of study, or an approved

urse of research, in a school of the University, or ıder teachers of the University. Centres for eliminary and intermediate medical studies have en established by the University at University and ing's Colleges. External students in addition to atriculating must register as preparing for an amination leading to a Degree or Diploma within e purview of the Council for external students.

niversity College.

University College has been constituted a Univer-y centre for the teaching of medical sciences. ıe College Faculty of Medical Sciences comprises e Departments of Physics, Chemistry, Botany, and ology (the Preliminary Medical Sciences); also e Departments of Anatomy, Histology, Physiology, ochemistry, and Pharmacology (the Intermediate edical Sciences). Research work is undertaken all departments. The completion of the building heme by the erection of the section for Anatomy, istology, and Embryology, together with further tensions to the Department of Physiology, which e generosity of the Rockefeller Foundation made ssible, provides exceptional facilities for research d post-graduate study in anatomy, physiology, d pharmacology. In particular might be specified e opportunities for investigation in human and mparative embryology and neurology, in histology, diology, anthropology, biochemistry, and experi-ental physiology and experimental embryology. rangements exist for the close correlation of the rk of the Faculty with University College Hospital d Medical School. Women students are admitted.

Scholarships and Prizes.—The first four items on e present list require a complete intermediate course University College. The money value and subjects examinations are as follows: (*a*) The Bucknill holarship, 160 guineas; (*b*) and (*c*) two Entrance hibitions, 55 guineas each, Chemistry, Physics, otany, and Zoology; (*d*) Entrance Scholarship, 0 a year for three years; (*e*) Cluff Memorial Prize, 5 biennially, Anatomy, Physiology, Pharmacology, d Chemistry; (*f*) Schafer Prize in Physiology, £18 ennially; (*g*) Sharpey Physiological Scholarship, 15, Biological Sciences; (*h*) Bayliss-Starling holarship, £120 a year, Physiology, Biochemistry; Morris Bursary for sons of deceased professional en, by nomination, tenable for two years, £20 a ar; and (*k*) five Gold and five Silver Medals arded annually in various departments. For rther information apply to the Secretary, Uni-rsity College, Gower-street, London, W.C.1.

ing's College.

The Medical Faculty at this College gives instruc-on in the subjects of Medical Science for the eliminary and Intermediate Examinations in edicine and Surgery, and Dental Surgery, of the niversity of London and of other Universities ıd examining bodies, to students entering the ollege directly, and also to students of the following ur hospital schools which prepare only for the ıal examinations—viz., King's College Hospital, estminster Hospital, St. George's Hospital, and aring Cross Hospital. The Faculty is open to oth men and women. Special courses in Anatomy ıd Physiology in preparation for the Primary xamination for the F.R.C.S. (England) are held vice yearly.

Scholarships and Prizes.—Two or more Warneford ntrance Scholarships of £30 each for four years. Exa-ination in April, subjects selected from Divinity, lassics, Science. Sambrooke Scholarship of £30 for ree years. Examination in April, subjects selected om Classics, Science. Worsley Scholarships: £100 in ve annual instalments of £20. *At the end of the irst Year* of study, the Rabbeth Scholarships (£30 ıd £15), the Carter Gold Medal and Prize in otany, and the Hare Prize in Zoology are open for mpetition. *At the end of the Third Year*, the Hughes rize in Anatomy, the Huxley Prize in Physio-gy, the Inchley Prize in Pharmacology, and ıe Jelf Medal are open for competition. The Layton and the Berridge Research Studentships (£150 per annum each), the Daniell Scholarship in Chemistry (£40), Warneford Prizes (£25 and £15), Leathes Prize, Barry Prize, &c., are also open to Students of this Faculty. The majority of the Scholarships and Prizes are open to Regular Students only. For further information apply to the Dean of the Medical Faculty.

Medical students of the University of London, who are pursuing their medical curriculum in the metropolis will proceed to one of the recognised medical schools connected with the University. At four of these schools the preliminary studies will be taken at King's College, while at the other schools the whole curriculum can be taken out in connexion with the selected hospital. These hospitals are St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the London Hospital, St. Mary's Hospital, the Middlesex Hospital, St. Thomas's Hospital, University College Hospital, Westminster Hospital, and the London (Royal Free Hospital) School of Medicine for Women. Various schools and hospitals are also recognised as schools of the University in special departments, and students may pursue their studies at other approved universities and medical schools, presenting themselves for examination at the University.

The FACULTY OF MEDICINE of the University grants the joint degrees of M.B., B.S. (*Bachelor of Medicine and Surgery*), the higher separate degrees of M.D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*), and the degree of B.D.S. (*Bachelor of Dental Surgery*) and the degree of B.Pharm. (*Bachelor of Pharmacy*); the two higher degrees being open only to candidates holding the M.B., B.S degrees of the University. The curriculum for the M.B., B.S. degrees is five and a half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University.

A. *Internal Students.*—For the Bachelor's degrees in Medicine and Surgery a student must normally, after registration as an internal student, have: (1) Attended prescribed courses of study for five and a half years in one or more schools of the University. (2) Passed the following examinations, under the conditions mentioned below: (*a*) The First Examination for Medical Degrees in Inorganic Chemistry, Physics, including Mechanics, and General Biology; (*b*) the Second Examination for Medical Degrees: Part I., Organic Chemistry; Part II., Anatomy, Physiology, and Pharmacology; (*c*) the Third Examination for Medical Degrees, or M.B., B.S. Examination in Medicine, Surgery, Obstetrics and Gynæcology, Pathology, Forensic Medicine, and Hygiene.

B. *External Students.*—For the Bachelor's degrees in Medicine and Surgery an external student must (1) have passed the Matriculation examination or have been exempted therefrom not less than five and a half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five and a half years subsequently to Matriculation and four and a half years subsequently to passing the First Examination for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools in the United Kingdom.

The First Examination for Medical Degrees (Inorganic Chemistry, Physics, including Mechanics, and General Biology) will take place twice in each year, commencing on the Monday following Dec. 7th and on the first Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (Part I.): Organic Chemistry.—This examination will take place twice in each year, commencing on the Thursday following the second Monday in March and on the Thursday following the first Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (Part II.) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the second Monday in November and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser; (8) Clinical Surgery; (9) Ophthalmology; (10) Oto-Rhino-Laryngology; (11) (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery, (*f*) Mechano-therapeutics; (12) Obstetrics and Gynæcology; (13) Lying-in Hospital; (14) The conduct of at least 20 Labours; (15) Antenatal Clinic; (16) Experience as a Clinical Clerk in Gynæcological Work; (17) General Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics and Gynæcology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology. These groups may be taken either separately or together, Bachelors of Medicine who graduated before May 1904, may obtain the B.S. by passing the Surgical part of the M.B., B.S.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the second Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis for approval and may be exempted from a part or from the whole of the written examination.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology, and Rhinology. A thesis may be submitted as for M.D.

Doctor of Philosophy.—A Degree of Ph.D. has been instituted in non-clinical subjects for Internal and External Students in the Faculty of Medicine. Candidates for this degree must hold, in a branch of study akin to that in which they propose to proceed to the Ph.D. Degree, the Degree of M.B., B.S., or B.D.S., or B.Pharm., or B.Sc.

Bachelor of Pharmacy.—The course extends over three years.

Full details of the prescribed curricula can be obtained free on application to the Academic Registrar, or for External Degrees from the External Registrar, University of London, South Kensington, S.W. 7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

St. Bartholomew's Hospital and College.

The hospital contains 757 beds, of which 687 are fo patients in the hospital at Smithfield and 70 at th Alexandra Hospital, Swanley. Special department have been organised for Diseases of Women an Children, the Eye, Ear, Larynx, and Skin, as well a for Orthopædic and Dental Surgery, and for Electr therapeutics and X Ray work. Whole-time Clinica Units under Professors of Medicine and Surgery hav been established. A new Surgical Block of ten ward with accommodation for 250 patients, and connecte with a block of five new operation theatres is no in use.

Ten house physicians and ten house surgeon are appointed annually, are provided with room and board, and receive £80 a year as salary A resident midwifery assistant, an ophthalmi house surgeon, and a house surgeon for disease of the throat, nose, and ear, and a house surgeon fo orthopædic surgery are appointed every six month and are provided with rooms and board and receiv a salary of £80 a year. Three resident administrato of anæsthetics are appointed, the senior for on year at a salary of £150, and two juniors for si months with a salary at the rate of £80 per annun with board and rooms. An extern midwifery assistar is appointed every three months, and receives salary of £80 a year. The clinical clerks, th obstetric clerks, the clerks to the medical ou patients, the dressers to the surgical in-patien and to the out-patients, and the dressers in the speci departments are chosen from the students. residential College is attached to the hospital.

There are quarters for the resident staff, casualt medical, surgical, and special out-patient department casualty wards, dispensary, and clinical lectu theatre. There is a chemical laboratory attach to the College as well as a laboratory devoted instruction in Public Health. A block is devoted Pathology, and contains the post-mortem room well as extensive laboratories for bacteriology, clinic pathology, and pathological chemistry. *The Medic College Buildings* include three large lecture theatre a large dissecting-room, laboratories for chemistr biology, morbid anatomy and histology, and publ health, as well as a spacious library (containing 14,5 volumes), a well-appointed museum of anatom physiology, comparative anatomy, materia medic botany, and pathological anatomy. The path logical museum is complete. A new block in Giltspu street has recently been acquired and has been fitt up as lecture theatres and laboratories for physic chemical physiology, experimental physiology, hist logy, and pharmacology.

Special Classes for the Primary and Final F.R.C. are held twice yearly. *Instruction in Prelimina Science* is given to University of London students chemistry, biology, and physics throughout the yea Facilities for research work are afforded in the Clinic Units and Laboratories of pathological and oth departments.

Scholarships given in aid of Medical Study.—F five of the Scholarships and the Exhibition—name (*a*), (*b*), two Entrance Scholarships in Science the respective values of £75 and £100; (*c*) Entran Scholarship in Arts, £100; (*d*) Jeaffreson Exhibitio £50; and (*e*) Shuter Scholarship, £50—a full University course at St. Bartholomew's Hospital required. The awards of (*a*) and (*b*) are made aft examination in selections from the subjects Chemistry, Physics, Zoology, Botany, Physiolo Anatomy, and Pathology; (*c*) and (*d*) are award

[1] Of these schools that of the Royal Free Hospital is reserv for women; University College admits men and women the whole course, the number of women being limited; Kin College admits men and women to the intermediate subject the remainder admit men only.

ter examination in Mathematics, Latin or reek or French or German, a second language or hemistry or Physics; (*e*) is awarded after competitive xamination among Cambridge Graduates in Anatomy nd Physiology. The more important of the other cholarships and prizes are as follows:—Four Junior cholarships—(*f*) No. 1, £30, Anatomy and Physiology (*g*) No. 2, £20, Anatomy and Physiology; (*h*) No. 3, £25, Chemistry, Physics, and Biology; (*i*) No. 4, £15, hemistry, Physics, and Biology; (*j*) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (*k*) irkes Scholarship, £30 and medal, Clinical Medicine; (*l*) and (*m*) two Brackenbury Scholarships, £39 each, ne in Medicine and one in Surgery; (*n*) Sir G. urrows Prize, 10 guineas, Pathology; (*o*) Skynner rize, 13 guineas, Regional and Morbid Anatomy; (*p*) Matthews Duncan Medal and Prize, £20, Midwifery nd Gynæcology; (*q*) Luther Holden Research cholarship in Surgery, awarded by election, £105; (*r*) Lawrence Research Scholarship and Gold Medal Pathology, awarded by election, £115; and (*s*) Baly Scholarship in Clinical Medicine, £75, warded by examination.

The recreation ground of 10 acres is at Winchmore ill for the use of the members of the Students' nion, which all students are expected to join. The tudents' Union contains a large reading and smoking oom, a committee and writing room, luncheon and ining hall, and a miniature rifle range.

Information may be obtained on application to the ean of the Medical College, Mr. W. Girling Ball. The Warden of the Residential College is Mr. R. M. Vick.

haring Cross Hospital.

The Hospital, to which the School is attached, ontains 300 beds. There are special departments r Mental Diseases, Midwifery, Diseases of Women, Children, of the Skin, Ear, Throat, Nose, and Teeth, r Orthopædic Cases, X Ray work, and for Electrical reatment.

In the Medical School Demonstratorships and ssistant Demonstratorships are open to students the School. Six House Physicians, six House rgeons, two Obstetric and Gynæcological House rgeons, and four House Surgeons to the Special epartments are appointed annually. The large roportion of resident appointments to the number students makes it probable that a student of rdinary ability will be able to obtain one of these ppointments.

The following appointments are open to students ter they have held resident appointments: Resident edical Officer, at a salary of £400 per annum; egistrar to the Medical, Surgical, Obstetrical and Ear, ose, and Throat Departments, at £150 per annum.

By an agreement with the University of London ne School sends its Primary and Intermediate tudents to receive their lectures and practical work King's College, which is situated within four minutes' alk.

Final studies are taken in the school and hospital, here systematic lectures, demonstrations, and itorial classes are arranged to cover all the subjects ecessary for qualifying examinations. Departments re also available for other final subjects of Materia edica and Operative Surgery.

An Institute of Pathology with a whole-time staff scientific workers and fully equipped laboratories as been established. Students receive their training Preventive Medicine, Pathology, Bacteriology, and iochemistry here, and are encouraged to undertake search. Special facilities are available for post-raduate research and study.

The course in Ophthalmology is given in the Royal Westminster Ophthalmic Hospital. Special demonrations are arranged for Post-graduates.

One Epsom School Scholarship, two Oxford and ambridge Scholarships, and one Scholarship in natomy and Physiology open to students of King's ollege, are offered for competition each year. In ddition there are a number of Exhibitions.

The Museum contains over 4000 specimens, including a notable collection of over 800 gynæcological specimens, the Cuthbert Lockyer Collection.

The social comfort and convenience of students are met by library, reading, and smoking-rooms, refreshment-room, in a Students' Club. The Club, which is under the control of a committee of students, provides needful athletic recreation, and includes also a medical society.

Further information may be obtained on application to the Dean, Mr. E. A. Crook, M.Ch., F.R.C.S.

St. George's Hospital.

This hospital has a service of 436 beds, of which 180 are allotted to surgical, 150 to medical cases, and 100 are at the Convalescent Hospital at Wimbledon. There are all the usual special clinical departments. One ward is set apart for Diseases Peculiar to Women, and there is a Maternity Ward of 11 beds. Children's beds are placed in the women's wards. There are two ophthalmic wards.

Twelve house physicians, 12 house surgeons, and 12 casualty officers are appointed annually. Special attention is directed to the following paid appointments, among others, which are open to students after they have held house office:—Resident Assistant Physician and Resident Assistant Surgeon, at £250 per annum each; Medical Officer to the Atkinson-Morley Convalescent Hospital, at £300 per annum; Medical Registrarship at £200 per annum, Surgical Registrarship at £200; Assistant Curatorship of the Museum at £100; Obstetric Assistantship (Resident) at £100; the post of Resident Anæsthetist at £100; the posts (3) of Junior Anæsthetists, each at £30.

Entrance Scholarships and Endowed Prizes of a total value of £968 are awarded annually; a detailed list is placed below. The entire teaching and laboratories are now devoted to purely clinical subjects, and arrangements have been made with the authorities of King's College for students who enter the first, second, or third year of the curriculum as students of St. George's to carry out the necessary courses of instruction at that College. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to clinical work.

Scholarships and Prizes.—At this school 11 entrance scholarships and exhibitions are given, the money value and the subjects of examination being as follows: (*a*) and (*b*) two William Brown Exhibitions, £120 and £80 respectively; (*c*) and (*d*) two Anne Selina Fernee Scholarships, £80 each; (*e*) Devitt-Pendlebury Scholarship, £50; (*f*) and (*g*) two Anne Selina Fernee Exhibitions, £40 each, Anatomy and Physiology, except in the case of (*c*) and (*f*) subject of examination for which is General Pathology.

In addition to the above Exhibitions, each of the value of £40 and up to four in number, will be awarded to candidates of approved merit in the Entrance Scholarships Examination. The others are as follows: (*h*) Allingham Scholarship in Surgery for Students qualified not more than two years, £87; (*i*) and (*j*) two Brackenbury Prizes, one in Medicine and one in Surgery, £33 each, open to students of not more than five years' standing; (*k*) H. C. Johnson Memorial Prize, £20, Practical Anatomy; (*l*) Pollock Prize, £24, Physiology, Physiological Chemistry, and Histology; (*m*) Clarke Prize, £5; (*n*) Thompson Medal, £9, Clinical Reports; (*o*) Brodie Prize, £8, Clinical Reports; (*p*) Webb Prize, open to perpetual pupils, £34, Bacteriology; (*q*) Sir Francis Laking Memorial Prize, £65, open to students having registrable qualifications.

The St. George's Hospital Club, with smoking- and luncheon-rooms on the hospital premises and an athletic ground at Wimbledon, is an amalgamation of the Hunterian Society, the *Gazette*, and the Rugby football, cricket, lawn tennis, boxing, rifle, and golf clubs. Students have the advantage of a library of medical and scientific books which is kept up to date.

Further information may be obtained from the Dean of the Medical School, Dr. A. Feiling.

Guy's Hospital.

The Medical School, which has been entirely rebuilt within recent years, provides ample accommodation with modern equipment for all the non-clinical subjects of the medical curriculum. The School is a constituent part of the University of London and offers a complete medical education of University standard throughout. The Hospital contains 646 beds, a total which is more than sufficient to provide the clinical material necessary to ensure that the students in the clinical period are given every opportunity to obtain a practical knowledge of clinical work. On commencing the clinical period, students are placed for three months under the charge of an experience Clinical Tutor while they are given a preliminary course of instruction in methods of clinical examination. Thereafter, they hold a series of appointments, each of three months duration, in surgical, medical, and obstetrical and gynæcological wards. Students are signed up after each appointment by the members of the staff to whom they have been attached. The type of instruction is essentially practical and students are given a larger amount of individual responsibility, provided that they show themselves worthy of it.

The following special departments are attached to the hospital: Departments of ophthalmology, laryngology, gynæcology, diseases of children, diseases of the nervous system, dermatology, otology, actiontherapeutics, anæsthetics, dentistry, orthopædics, vaccine, tuberculosis, genito-urinary and venereal diseases, Salomon's Welfare Centre (for Maternity and Children). Dresserships and clerkships in the various special departments are held by students after they have completed their general medical and surgical and their obstetrical and gynæcological appointments.

There is a Venereal Clinic, in accordance with the Scheme of the Local Government Board and London County Council. Lectures and clinical instruction are given, to which Medical Students and Practitioners are admitted without fee.

House physicians, house surgeons, out-patient officers, assistant house surgeons, obstetric residents, house surgeons in the departments of ophthalmology, laryngology, and genito-urinary diseases, house physicians in the departments for neurology and dermatology and for diseases of children, and clinical assistants are appointed from among recently qualified students according to merit.

Scholarships. — Six entrance scholarships are awarded annually as follows:—(*a*) one War Memorial scholarship, of the value of £200, to be awarded alternately in Arts and Science (next award, June or July, 1932, in Arts); (*b*) one Open Arts Scholarship of £100 for students under 19 years of age; candidates are required to take English and any two of the following subjects: Latin, Greek, French, German, and Mathematics; (*c*) one Open Junior Science scholarship for students under 20 years, £100; subjects, any three of the following: Inorganic Chemistry, Physics, Biology, and Mathematics; (*d*) a confined Junior Science scholarship of the value of £100 is offered for competition, annually in June or July, to candidates who have attended the Preliminary Science Classes at this School; (*e*) two open Senior Science scholarships: (1) a War Memorial scholarship of the value of £100, awarded annually in September: (2) an open scholarship of the value of £80, awarded annually in September, for students who have completed the curriculum for, or passed the examinations in, Anatomy and Physiology for a medical degree in any University of the British Empire, and who, during the nine months immediately preceding the Scholarship examination, have not entered as students in any Metropolitan Medical School other than Guy's; subjects, any two of the following: Anatomy, Physiology, Organic Chemistry and Pharmacology, General Pathology.

Within the grounds of the hospital are situated the residential college, with accommodation for 35 students, the students' club, with reading, smoking, luncheon, and dining-rooms, a fives court, and swimming bath. The athletic ground and club house is situated at Honor Oak Park, and can be reached in 15 minutes from the hospital.

Further information, together with full particulars of Scholarships, and a booklet entitled "How to Enter the Medical Profession," will be sent post free on application to the Dean of the Medical School Guy's Hospital, London, S.E. 1.

King's College Hospital.

The final subjects in the curriculum are taught at the Medical School of King's College Hospital, which is situated at Denmark Hill, S.E. 5.

The hospital has 400 beds, and provision will be made ultimately for 600. There are special departments for Bacteriology, Cardiology, Children, Clinical Pathology, Dermatology, Gynæcology and Obstetrics, Laryngology, Massage, Medical Chemistry, Neurology, Odontology, Ophthalmology, Orthopædics, Otology, Physical Treatment, Psychological Medicine, Radiology, Rhinology, and Urology, each in charge of a specialist and his staff.

Appointments.—The appointments open to students are those of clinical assistant to the general and special departments; medical, surgical, obstetric, and pathological tutorships; resident casualty officers; house physicians and house surgeons; resident anæsthetist; resident radiologist; bacteriologist; clinical pathologist; pathological, medical, surgical, and obstetrical registrarships. Sixteen resident medical and surgical officers are appointed half-yearly.

Scholarships and Registrarships (those in connexion with King's College have already been enumerated).—Scholarships of the total value of £1530 are awarded annually. These include (*a*) Medical Entrance Scholarships—Science, £75; Anatomy and Physiology, £75; Pathology, £75; (*b*) two Burney Yeo Entrance Scholarships, £80 each, open to students of Oxford and Cambridge on the recommendation of the Regius Professors; (*c*) two Raymond Gooch Scholarships, £120 each, open to students of British Universities on certain conditions; (*d*) Epsom College Scholarship, value £100, offered annually to a student of Epsom College who has taken the first part of the courses for Medical Degrees at the Universities of Oxford, Cambridge, or London; (*e*) two Seamen Scholarships, each £50 a year for a period not exceeding five years, restricted to the sons of clergymen of the Church of England; (*f*) Senior Scholarship (Clinical Studies), £40. The holders of the Warneford and Sambrooke Scholarships awarded by King's College take the subjects of the preliminary and intermediate examinations at King's College, and the final subjects at King's College Hospital. Three Sambrooke Registrarships, open to matriculated students who have filled certain appointments in hospital.

Prizes.—Tanner Prize, £10, Obstetrics and Diseases of Women; Todd Prizes, First £8 and medal, second £4, for Clinical Medicine; Burridge Prize, £4 4s. Forensic Medicine; Jocelyn Almond Prize, £5 5s. Diseases of Children; Wallis Prize, £10, History of Dentistry; The Ferrier Prize in Neurology, Bronze Medal and £20. 13 Class Prizes, £3 each.

The King's College Hospital Clubs and Societies Union consists of the Listerian and Musical Societies, the Students' Common Rooms, and the various athletic and sports clubs. The athletic ground, over six acres in extent, is on Dog Kennel Hill, about ten minutes' walk from the hospital. There are also Tennis Courts in the grounds of the Hospital and of "The Platanes"—a hall of residence for students of the College and the hospital.

The Calendar of the School will be sent on application to either of the following: Dr. H. Willoughby Lyle, Dean; Mr. S. C. Ranner, Secretary of the Medical School.

ondon Hospital.

The hospital, with its Medical College and Dental chool, is situated in Mile End-road, and contains 39 beds which are in constant use. The Hospital the largest in England. Its position in the neighourhood of the extensive docks, factories, and orkshops of the East of London renders it one of ie most important hospitals in the world. During 929, 89,972 patients were attended to in the Receiving oom and the Out-Patient Departments, and in the ards 13,992 patients received treatment. The ondon Hospital presents, therefore, a large field for inical Instruction, and in its Wards and Out-patients' oms exceptional opportunities are afforded for quiring an extensive and practical experience of all ases of disease. There are special departments for ie treatment of diseases of Children, the Eye, Ear, ose and Throat, Skin and Teeth. In addition ere are departments devoted to Gynæcology and bstetrics, Orthopædics, Cardiography, Radiology, lectro- and Physico-therapeutic Light Therapy, adium, and Vaccine Therapy. The Special Departents are attended by a large number of patients, id afford to the student the means of becoming perienced in every branch of practice. The recent ditions have greatly increased the efficiency with hich the Clinical Teaching can be given.

A Clinical Unit in Medicine, under the charge of whole-time director, provides for the more elaborate ethods of diagnosis and treatment, and takes a ading part in the initiation and coördination of edical research. The director has an assistant rector, two assistants, and two house physicians.

To each medical and surgical firm throughout the spital there is attached a First Assistant, who is sponsible for instructing the clerks or dressers of ie firm in elementary medicine and surgery, and ho assists the honorary members of the firm in ie preparation of their demonstrations. In the partment of Obstetrics and Gynæcology there are vo assistants and two resident accoucheurs. Special urses of lectures and demonstrations are arranged Medicine and Surgery and their ancillary subjects. pportunities for research are provided under the pervision of the staff.

Owing to the large number of patients more appointents are open to students before and after qualificaon than at any other hospital. Holders of resident ppointments have free board. Special classes are ld for the examinations of the University of London, r the Fellowship of the Royal College of Surgeons, r the Membership of the Royal College of Physicians, id for other higher examinations. Special entries for edical and surgical practice can be made.

The salaried appointments open to past students the hospital are those of assistants to the medical nit; first assistants to the medical and surgical ms; assistants to the departments of obstetrics and næcology; clinical assistants in the medical, surgical, phthalmic, aural, light and skin, orthopædic, and ectrical departments, and in the Institute of Pathogy and Clinical Laboratory. There are appointed nually four resident accoucheurs, 14 resident house ysicians, and 22 resident house surgeons, 14 resident ceiving-room officers, 8 resident emergency officers, clinical assistants to the medical out-patient departent, and 16 clinical assistants to the surgical outtient department, also paid and unpaid clinical sistants in the various special departments.

Scholarships and Prizes.—Entrance Scholarships: rice Scholarship £100, and one Scholarship of £50, bjects of First Medical Examination at the niversity of London; Epsom College Scholarship, ee education, subjects of First Medical Examination above; Price Scholarship, open to students of xford and Cambridge Universities, (1) £100, thology; (2) £100, Human Anatomy and Physiogy; two Open Scholarships, each of the value of 00, subjects, Human Morphology and Embryology, ysiology and Pharmacology, Biochemistry, Pathogy, Bacteriology and Morbid Anatomy. Prizes: Buxton Prize, £40, subjects of Anatomy and Physiology; three Prizes for Clinical Work, £20 each, Medicine, Surgery, and Obstetrics and Gynæcology; Sutton Prize, £20, Pathology; Duckworth Nelson Prize, biennial, £10, Practical Medicine and Surgery; Letheby Prizes (2), £25, Chemistry and Chemical Pathology; four Dressers' Prizes, amounting to £20, zeal, efficiency, and knowledge of Elementary Clinical Surgery; Hutchinson Prize, triennial, £60, Clinical Surgery; Treves Prize, £15, Clinical Surgery; two Practical Anatomy Prizes, £6 and £4 respectively; Andrew Clark Prize, £14, Clinical Medicine and Pathology; T. A. M. Ross (Prox. Acc.) Prize, £10 10*s.*, Clinical Medicine and Pathology; James Anderson Prizes (4), £20, Elementary Clinical Medicine; Arnold Thompson Prize, £15, Diseases of Children; and Liddle Prize, triennial, £120.

Medical Research Funds.—Funds to the value of over £113,000 permit of financial assistance being given to students and graduates engaged in Medical Research.

A laboratory for the manufacture of certain preparations of Radium has recently been endowed.

A Residential Hostel is provided for students, and a hostel for resident medical officers. The Union Athletic Ground, 13 acres, is within easy reach of the hospital.

Dean: Prof. William Wright, M.B., D.Sc., F.R.C.S.

St. Mary's Hospital.

The Hospital and Medical School have on one side a poor district of 500,000 persons, and on the other side the residential districts of Kensington and Bayswater. The hospital contains 350 beds, and recent structural additions have added two new operating theatres. By a scheme of affiliation, for teaching purposes, of certain neighbouring hospitals, the teaching facilities extend over 1000 beds. The Medical School provides complete courses of instruction, and students can join at once on passing a Preliminary Examination in Arts. Terms begin in October, January, and April.

Clinical Units in Medicine and Surgery were established in 1920. Under this system Professors of Medicine and Surgery, with competent assistants, give their whole time to teaching and research. This means a regularity of teaching and a degree of individual attention that are only possible where Units exist. The system also provides additional salaried posts which are open to students after qualification.

Teaching of Midwifery.—The Hospital has lying-in beds, and in addition to the instruction thus obtained each student attends a short course at Queen Charlotte's Hospital, as part of his training in Midwifery, without additional fee. Under the new building scheme it is proposed to institute additional lying-in wards.

Students specially interested in Pathology and Bacteriology have singular advantages at St. Mary's. The institute comprises seven special departments, the whole being under the personal direction of Sir Almroth Wright. Certain Research Scholarships of £200 each are awarded annually to students working in the departments of the institute; and research beds have been instituted. Clerkships in Pathology, Bacteriology, and Chemical Pathology, lasting for a period of three months, are open to students of the fifth year, and enable them to carry out the Pathological and Bacteriological investigations of the wards, and learn the necessary technique under supervision. Seventy-two of these posts are available annually. Numerous appointments are open to newly qualified members of the Medical School, including ten salaried posts with salaries varying from £200 to £750 per annum. A special Post-graduate course is held during the first week-end in October, and is open to all General Practitioners and other qualified men without fee.

Entrance Scholarships.—Two Entrance Scholarships of the value of £210 each are awarded annually, by nomination in July, the Geraldine Harmsworth Scholarship, £200, and one or more University Scholarships of £200 are awarded in July.

The Athletic ground (10 acres) is situated at Wembley and can be reached in 20 minutes by a constant service of trains. A large pavilion has recently been added.

Rebuilding of the Medical School.—The site for the rebuilding of the Medical School and Inoculation Department has already been cleared, and building operations will be commenced shortly. The new School will contain departments for the teaching of all Preliminary and Intermediate subjects, and will include a student's club, dining and billiard rooms, and a gymnasium and swimming bath.

For further information apply to the Dean of the Medical School.

Middlesex Hospital.

The hospital and cancer wing contain over 470 beds, with special wards for Cancer, Maternity, Gynæcological, Otological, Neurological, and Ophthalmological cases, and for Diseases of Children. Other special departments include those for Diseases of the Eye, Ear, Nose and Throat, and Skin; Nervous Diseases, Orthopædic cases, Diseases of the Rectum and Venereal Diseases. There is also an Electrotherapeutic department. The Cancer Wing, containing 92 beds and Special Investigation Laboratories, offers unrivalled opportunities for the study of Cancer, both in its clinical and pathological aspects. In the Electrotherapeutic Department, students obtain instruction in the Treatment of Lupus and Cancer by the X ray method of treatment.

All appointments are made without fee of any kind, and the following are appointed at intervals annually: six house physicians, eight house surgeons, two obstetric and gynæcological house surgeons, two casualty medical officers, two casualty surgical officers, one senior resident anæsthetist, two junior resident anæsthetists, and four resident officers to the special departments. Ten registrars are appointed annually. Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department.

The Medical School, which includes the Bland-Sutton Institute of Pathology, the Courtauld Institute of Biochemistry, and the Barnato-Joel Laboratories, is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum, for the Diplomas in Public Health, and the University of Cambridge Diploma in Radiology, for which two courses are held yearly. Ample laboratory and classroom accommodation is provided. The teaching staff includes 6 Professors, 32 recognised Teachers, 10 Demonstrators, 4 Tutors. The Bland-Sutton Institute of Pathology and the Courtauld Institute of Biochemistry are completely equipped for routine hospital investigations, teaching and research work, and contain large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped Anatomical and Pathological Museum and Reference Library offer every facility.

Other features of interest are: the course in Medical Radiology and Electrology, under the direction of the "Joel" Professor of Physics; D.P.H. course, under the direction of Dr. Charles Porter, M.O.H., St. Marylebone, Prof. J. McIntosh, and Prof. W. B. Tuck. A primary F.R.C.S. course is held twice yearly, and also special classes to prepare students for the Intermediate Examinations of the Universities.

Scholarships and Prizes.—Two Entrance Scholarships, value £100 each, and two University Scholarships, value £90 and £60, are awarded annually in September. The successful candidates are required to become general students of the school. A Freer Lucas Scholarship is awarded annually on the nomination of the Headmaster of Epsom College. There are also two Broderip Scholarships, value £60 and £40 respectively; the Lyell Gold Medal and Scholarship, value £55 5*s.*; the John Murray Medal and Scholarship, value £25 (awarded every third year); the Freeman Scholarship, value £30; the Hetley Clinical Prize, value £25; the Leopold Hudson Prize, value 11 guineas; and the Second Year's Exhibition value 10 guineas. There are numerous class prizes.

The Students' Amalgamated Clubs include the following: Medical Society, Common Room Society, Musical Society, cricket, football, rowing, chess, lawn tennis, hockey, sailing, and fencing. There are a restaurant and a gymnasium in the school buildings and athletic grounds at N. Wembley, with pavilion.

For further particulars apply to the Dean or the Secretary of the Medical School.

St. Thomas's Hospital.

This Hospital contains 644 beds. There are special departments for the treatment of women children, diseases of the eye, ear, nose and throat skin, teeth, and for orthopædics. Nervous and mental diseases are treated in special departments An electrocardiograph has been installed for the investigation of diseases of the heart. The Tuberculosis Department forms a part of the Lambeth scheme for treatment of patients and for instruction The Venereal Department has been established as part of the London County Council scheme. Departments for Radiology, Electrotherapy, Phototherapy Massage and Remedial Physical Exercises are also special features. A speech clinic has been inaugurated in connexion with the Children's Department Exceptional facilities are offered in the hospital laboratories for the study of General Pathology, Clinical Pathology, Chemical Pathology, and of Treatment by Serums and Vaccines. Surgical operations take place in the main theatres every day. Clinical teaching in the wards, out-patients' and special departments, is available every day of the week Clinical lectures are delivered every Wednesday during the sessions. Clinical Units in Medicine and Surgery have been established.

All appointments in the hospital are open to students without extra fee. Clinical clerks and dressers for in- and out-patients are selected from students who have completed their third years' work Every student acts as clerk in the post-mortem room and in one of the pathological laboratories, takes his turn on maternity duty under proper supervision in the maternity ward and district, thus obviating any necessity for seeking instruction elsewhere. Students are instructed in the administration of anæsthetics by the hospital anæsthetists.

The arrangements are made to meet the requirements of all the Examining Bodies. Special classes are held for the examinations at the University of London and for the First and Final Fellowship Examinations of the Royal College of Surgeons of England. Tutorial classes in all subjects precede the various examinations. The hospital is easily accessible from all parts.

Appointments.—A Resident Assistant Physician and a Resident Assistant Surgeon, salary £225 each per annum, and a Resident Anæsthetist, salary £200 per annum, are appointed annually. Three medical and two Surgical Registrars at a salary of £250 rising to £300 hold their appointments on a tenure renewable to a maximum of four years. A Pathological Registrar to the Department of Obstetrics and Gynæcology (at an annual salary of £250), an Ophthalmic Registrar (at an annual salary of £200) and an Orthopædic Registrar (unpaid) are appointed yearly. Eight Resident Casualty Officers and Anæsthetists are appointed every six months. Seven House Physicians (including two Obstetric House Physicians, and one House Physician to the Department of Diseases of Children), nine House Surgeons (including two Ophthalmic House Surgeons, one Orthopædic House Surgeon, and two House Surgeons to the Ear, Nose and Throat Department) are appointed every six months. Clinical Assistants in the Special Departments are appointed every three months, and hold office for six months if recommended for re-election. There are three Assistants in the Depart-

ent of Pathology; the Senior receives £600 a year, id the two Juniors £450 each.

Scholarships and Prizes.—At this school there are ie following Entrance Scholarships—namely, two Arts, equivalent to the tuition fees for the first ar of study; two in Natural Science, of the value of 50 and £60 respectively; and the University holarship of £100 in any two of the following: natomy, Physiology, Pathology, Chemistry, also ie "Hector Mackenzie" University Exhibition of ie value of £40. The value of all entrance scholar-ips must be taken out in tuition fees. The money alue and subjects of examination of the remainder e as follows: (*a*) William Tite Scholarship for cond-year students, £25; (*b*) and (*c*) Musgrove holarship or (alternately) Peacock Scholarship ch for third-year students and tenable for two ars, £35 each; (*d*) Mead Medal, Medicine, Pathology id Hygiene; (*e*) Wainwright Prize, Medicine; (*f*) oller Prize, Medicine; (*g*) Cheselden Medal, Surgery id Anatomy; (*h*) Clutton Memorial Medal in inical Surgery, biennial; (*i*) Beaney Scholarship, 50, biennially, Surgery and Surgical Pathology;) Solly Medal and Prize, biennial, Reports of Cases;) Sutton Sams Prize, biennial, Report of Cases; Bristowe Medal, Pathology and Morbid Anatomy;) Hadden Prize, Pathology and Morbid Anatomy;) Grainger Testimonial Prize, £31 10*s.*, Anatomy id Physiology; (*o*) Louis Jenner Research Scholar-ip, tenable for two years, £60 annually, Pathology. St. Thomas's House, the New Students' Club cently opened, comprises spacious dining-, smoking-, id reading-rooms, and accommodation for some resident students. There is no occasion for students leave the hospital premises during working hours. Further information may be obtained from the edical Secretary of the School, St. Thomas's Hospital.

niversity College Hospital.

The final subjects in the curriculum are taught at e Medical School of the hospital, which has 526 beds, cluding 74 in the new obstetric hospital. The course instruction is suitable for the examinations at the niversities of Oxford, Cambridge, Durham, and other ritish Universities, and for the medical education quired by the Examining Board in England and the ociety of Apothecaries. Clinical Units in Medicine, rgery, and Obstetrics and Gynæcology are now in eration. The whole-time Directors of the Units are ncerned with the organisation of the teaching gener-ly, but the honorary staff are responsible for the rgest share of the teaching in the wards and Out-tient Department of the hospital. The department otology, rhinology, and laryngology (the Royal Ear ospital) has been provided with a separate building Hunter-street, adjacent to the obstetric hospital. contains 39 beds, including eight private wards for tients of limited means. The hospital is equipped th all modern appliances for investigation. The w buildings of the Obstetric Hospital of 74 beds ndered possible by the Rockefeller Benefaction), e new Residents' House (with accommodation for residents and students), the extension to the Nurses' ome, and new research laboratories for the Medical hool are now finished and in full occupation. Twelve omen students are admitted annually.

Those who are desirous of carrying out original search in Pathology, including Morbid Anatomy, cteriology, Experimental Pathology, and Chemical thology, are admitted to work in the labora-ries of the school by the Professor of Pathology, d under certain conditions can receive grants from e Charles Graham Medical Research Fund. A ecial course of instruction is given in conjunction th University College for preparation for the exam-ations for Diplomas in Public Health of the various iversities and examining bodies. In the Dental hool in Great Portland-street, formerly known the National Dental Hospital, there is afforded e opportunity for attending lectures and practical struction in diseases of the mouth and teeth.

Appointments.—Clerkships and dresserships to the physicians, surgeons, anæsthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the Medical School and Hospital. Sixteen house physicians, ten house surgeons, ten obstetric assistants, four house surgeons to the Royal Ear Hospital (of the total number of resident officers not more than three may be held by women students at any one time) are selected annually by examination from among the senior students who have a medical qualification. All house officers reside free in the hospital. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital: Resident Medical Officer, Surgical Registrar, Medical Registrar, Obstetric Registrar, Harker-Smith Cancer Registrar, Ophthalmic Registrar, Registrar to the Royal Ear Hospital, Casualty Medical Officer and a Casualty Surgical Officer, Assistants in Ear and Throat, Skin and Venereal Diseases Departments, and House Anæsthetist.

Assistants to Medical, Surgical, and Obstetric Units.—These salaried appointments which have come into existence recently at the same time as the creation of the whole-time Chairs in Medicine, Surgery, and Obstetrics, are of great value to senior students who may desire to remain at Hospital after holding the ordinary resident appointments. They enable a man to continue clinical work and also to devote time to laboratory or other research, so as to fit himself for higher posts in the profession. The salaries range from £250 up to £900 a year, resident quarters being provided only for the chief assistant to the Obstetric Unit. The total number of such Assistantships varies from time to time, being generally about 12, and an aggregate sum of about £5000 annually is available for their salaries.

Scholarships and Prizes (those in connexion with University College have already been enumerated).—At this School the first two Scholarships (*a*) and (*b*) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (*c*) and (*d*) entitle to a final course at the Medical School. The money value and subjects of examination are as follows:—(*a*) Entrance Scholarship, Bucknill, 135 guineas, Chemistry, Physics, Botany, and Zoology; (*b*) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (*c*) and (*d*) two Goldsmid Entrance Exhibitions 112 guineas each, Anatomy or Physiology, or General Pathology; (*e*) Graham Scholarship in Pathology, £300 per annum for two years, awarded by the Senate of the University of London; (*f*) Atkinson Morley Scholarship, tenable for three years, £45 per annum, Surgery; (*g*) Atchison Scholarship, tenable for two years, £55 per annum, General Proficiency in Medical Studies; (*h*) Magrath Clinical Scholarship, about £150, Clinical Cases; (*i*) Percival Alleyn Scholarship, about £75, Surgery; (*j*) Filliter Exhibition, £30, Pathology; (*k*) Erichsen Prize, £10 10*s.*, Practical Surgery; (*l*) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (*m*) two Liston Gold Medals for Clinical Surgery; (*n*) Alexander Bruce Gold Medal for Pathology and Surgery; and (*o*) Tuke Silver and Bronze Medals for Pathology. (*p*) Radcliffe Crocker Travelling Scholarship for Dermatology. (*q*) Leslie Pearce Gould Travelling Scholarship for Surgery.

The *Museum of Pathological Anatomy* is open for study daily, and microscopic sections of most of the specimens have been prepared and are available for the use of students on application to the Curator. The Anatomical Museum of the University of London, University College, is open to all students of University College Hospital and Medical School on the recommendation of the School Committee. The Medical Library, open daily to every student of the School, contains about 20,000 works on medical subjects,

including all the current text-books and works of reference required for study or research.

The Medical Society of University College Hospital Medical School exists for the dual purpose (1) of promoting the study of medical and surgical science, and (2) of promoting social intercourse among its members. All male students of the Medical School are required to become members. Meetings are held once a fortnight for the purpose of discussing subjects connected with the study of medicine. In its social aspect the society includes various athletic clubs and superintends the gymnasium and squash racquet courts in the Medical School, and the Athletic Ground at Perivale.

University College Hall, Ealing, is recognised by the authorities as a residential hostel. The Students' House in University-street contains large and comfortable rooms. The Maternity Students occupy them on payment of a moderate charge.

Full information can be obtained from the Dean of the School.

Westminster Hospital.

The Hospital contains 248 beds, and has attached to it a Radium Clinic with 22 beds, elaborately equipped for all forms of Radium Therapy and Research. There are separate departments for diseases of the eye, skin, teeth, ear, nose and throat, for orthopædic practice, for diseases of women, for diseases of children, for radiography, for venereal disease, and for massage, electrical and light treatment. The anatomical, pathological, and materia medica museums are open to all students of the School.

The entire teaching of the Hospital is devoted to the subjects of the Final Examinations. Arrangements are made for the tuition required for Preliminary and Intermediate subjects.

Appointments: Paid appointments as Medical, Surgical, and Obstetric Registrars, Casualty Officers, House Physicians, House Surgeons, Anæsthetist, &c., are available for students when they have passed their examinations.

Research: There are excellent opportunities for Research work in the recently endowed John Burford Carlill Laboratories. Grants to assist Research workers are made annually from the John Burford Carlill Endowment.

Fees: Annual fee, £40. An entrance fee of 10 guineas includes membership of the Sports Union Club with its various branches—i.e., football, cricket, tennis, boxing, and Guthrie Society. The Athletic Grounds are situated in Tooting and are reached in 20 minutes from the hospital.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: Two Scholarships in Anatomy and Physiology, £75 each. Summer Session: Two Scholarships in Anatomy and Physiology, £75 each. A certain number of Scholarships have been allotted to Universities of England, Wales, and the Colonies, and to Public Schools. These Scholarships are awarded entirely on the nomination of the principal of the university or school. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, about £6, Reports on Cases; Chadwick Clinical Surgery Prize, £5, Reports on Cases; Chadwick Prize, £21 in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederic Bird Medal and Prize, open to Fourth-year Students, £14 in medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology 5 guineas, a Paper and Tests in Practical Work; Hanbury Prize in Diseases of Children, 10 guineas; Alfred Hughes Memorial Prize, open to Second-year Students, about £5 in books or instruments—Anatomy; Huxley Memorial Prize, 3 guineas in books or cash, open to Second-year Students—Physiology; Carter Gold Medal and Prize for Botany, open to Students of not more than three years' attendance, gold medal and books of the joint value of £15; Jelf Medal awarded to Third-year Students; Second year Scholarship £20, Elementary Anatomy, Physiology, Histology and Organic Chemistry; Daniel Scholarship, £40, Chemistry; Rabbeth Scholarship open to First-year Students, one of £30 and one of £15 Class Examinations in the Preliminary Scientific Course. Inquiries should be addressed to the Dean of the Medical School.

Royal Free Hospital: London School of Medicine for Women.

The Royal Free Hospital contains 268 beds. The Hospital also has large Casualty and Out-patient Departments. A Children's Department, including 18 cots, an Orthopædic Department, and a Light Department have recently been added to the Hospital. Maternity Districts are attached to the Unit operating in the Gray's Inn-road and Essex-road areas. Students also attend the in-patient and out-patient practice at the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital, Queen Square, South London Hospital, and Royal London Ophthalmic Hospital.

A Clinical Unit in Obstetrics has been established controlling 68 beds. Courses are arranged for the Primary Fellowship Examination of the College of Surgeons. The Eastman Dental Clinic, for which Mr. George Eastman, of Rochester, N.Y., has provided the building fund, is in course of erection and will provide a Dental School for women; at present the course for dental students is in conjunction with the Royal London Dental Hospital, Leicester-square.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficient of teaching and practical work in all departments.

There are residential chambers in the neighbourhood and the Warden can be consulted on the subject.

Students after qualification can hold the posts of house physicians, house surgeons, obstetric assistant, clinical assistants, assistant anæsthetist, medical, gynæcological, and surgical registrars, and assistant pathologist; and at the Medical School the posts of demonstrators in the departments of Anatomy, Physiology, Pharmacology, Biology, Chemistry, and Physics.

Scholarships and Prizes.—Among the larger of the awards are the following:—(*a*) Isabel Thorne Scholarship, £30. (*b*) St. Dunstan's Medical Exhibition, £ a year, tenable for three or five years. (*c*) M. George M. Smith Scholarship, £50 a year, tenable for three or five years. (*d*) Bostock Scholarship, tenable for two or four years, £90. (*e*) Mabel Sharman Crawford Scholarship, tenable for four years, £20 a year. (*f*) Sir Owen Roberts Scholarship, £ a year for four years. (*g*) Mabel Webb Research Scholarship, tenable for one year and renewable, £30. Physiology, Chemistry, or Pathology. (*h*) Fanny Butler Scholarship, tenable for four years; next award in July, 1931, £16. (*i*) John Byrne Bursary, tenable for two years, for students already in the School requiring assistance for the prosecution of their medical studies; application to the Secretary by March 31st next, £20. (*k*) Helen Prideaux Prize and Julia Ann H. Cock Prize, to be spent in assisting the newly qualified holder to further study, £60 each. (*l*) Dr. Edith Pechey Phipps Post-graduate Scholarship of the value of £1 open to all medical women, preferably coming from India, or going to work in India. (*m*) Sarah Holborn Scholarship, value £20 a year for three or five years, awarded every alternate year; next award in 1931. (*n*) Dr. Margaret Todd Scholarship, tenable for four years, £37 10*s.* a year, awarded in alternate years; next award in July 1931. (*o*) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, tenable for four years, awarded every four years; next award in July 1932. (*p*) Alfred Langton Scholarships, tenable for years, one awarded annually, £50 a year. (*q*) Schola Jubilee Bursary, tenable for three years, £50 a year.

r) Flora Murray Bursary, awarded every year to a ifth-year student, £50. The Dorothy Chick Gift, 20, is awarded annually for efficiency in Practical Midwifery. The Students' Union arranges the social, thletic, and other clubs and societies.

Inquiries may be addressed to the Warden and Secretary of the Medical School, 8, Hunter-street, London, W.C.

UNIVERSITY OF DURHAM.

The University of Durham grants degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery, Doctor of Surgery, Bachelor of Hygiene, Doctor of Hygiene, Bachelor of Dental Surgery and Master of Dental Surgery, a Diploma in Public Health, Diploma in Psychiatry, and a Licence in Dental Surgery.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Biology and Organic Chemistry. The subjects of the Second Examination are—Anatomy and Physiology. The subjects of the Third Examination are—Pathology and Bacteriology, Materia Medica, Pharmacology and Pharmacy, Medical Jurisprudence, and Public Health. The subjects of the Fourth Examination are—Medicine, including Therapeutics, Clinical Medicine, Surgery, Clinical Surgery, Operative Surgery, Midwifery and Gynæcology, Psychological Medicine, Diseases of the Skin, of the Throat, Nose, and Ear, and of Children, and Ophthalmology. It is required that at least one of the five years of professional education shall be spent at the University of Durham College of Medicine, Newcastle-upon-Tyne.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must also have obtained the degrees of Bachelor of Medicine and Surgery of the University of Durham, and must have been engaged for at least two years subsequently to the date of admission to these degrees in research work, or in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical or surgical practice. The candidate for the M.D. degree may present an essay or undergo a special examination in the subjects of Medical Anatomy, Medical Pathology, and the Principles and Practice of Medicine. The subjects of examination for the M.S. are:—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Medicine (without residence).—The University of Durham instituted a special examination whereby the degree of Doctor of Medicine may be obtained without residence. Candidates must not be under 40 years of age and must have been in active practice for 15 years as registered medical practitioners. They must also produce certificates of moral character from three registered members of the medical profession. The fee is 50 guineas (including the degree fee), of which 20 guineas is retained if the candidate fails to satisfy the examiners.

Attention is particularly directed to the fact that the Senate of the University on the 4th February, 1930, decided that this examination should not be held after June, 1932.

Doctor of Surgery.—The University of Durham grants the Degree of Doctor of Surgery. Candidates for this degree must be registered medical practitioners, and not less than 25 years of age. They must devote three years, subsequently to obtaining a registrable qualification, to the study of Surgery and ancillary subjects. One at least of the three years must be spent in the University. The candidate must submit to the Professor of Surgery the course of study he proposes to follow, and this course must be approved by the Board of the Faculty of Medicine. One year shall be devoted mainly to work in the departments of Anatomy, Physiology, Pathology, and Bacteriology, and the candidate must submit evidence of having so worked. Not less than six months of another year must be spent as resident surgeon in a recognised teaching hospital, and the rest of the year in the study of surgery in a recognised medical centre. Not less than six months of one of the three years must be spent in surgical study abroad.

Candidates for any of the above degrees, diplomas, or licence must give at least 28 days' notice to the Secretary of Examinations, University of Durham College of Medicine, Newcastle-upon-Tyne. In the case of the M.D. (essay) examination candidates must send in their essays before April 1st.

Scholarships and Prizes.—The following are awarded:—University of Durham Entrance Scholarship, £25 a year for four years; Pears' Entrance Scholarship, £40 a year for three years (awarded every third year); Heath Entrance Scholarship (from Kepier Grammar School), £60 (renewable); Province of Durham Masonic (Entrance) Scholarship, £60 (renewable); Heath Scholarship for Surgery, £200, available every second year; Rutherford Morison Surgical Scholarship, £180, available every third year.

The following Scholarships are tenable for one year, namely:—Tulloch Scholarship for Elementary Biology and Organic Chemistry, £20; Dickinson Scholarship for Medicine, Surgery, Midwifery, and Pathology; Gold Medal and £20; Charlton Scholarship for Medicine, £25; Gibb Scholarship for Pathology, £28; Luke Armstrong Scholarship for Comparative Pathology, £25; Stephen Scott Scholarship for Surgery, £40; Philipson Scholarships for highest marks in Final M.B., B.S. Examinations, two of £45 each; Goyder Memorial Scholarship for Clinical Medicine and Clinical Surgery, interest on £325; Gibson Prize for Midwifery and Diseases of Women and Children, £10; Turnbull Prize and Silver Medal for Surface Anatomy; and Outterson Wood Prize for Psychological Medicine, £10; Sewell Memorial Prize and Silver Medal for Clinical Pathology.

For further information apply to the Dean of the College.

Newcastle-upon-Tyne: College of Medicine.

Hospital practice is carried out at the Royal Victoria Infirmary, a general hospital containing more than 550 beds, and there are facilities for the study of the various special subjects.

Practical midwifery can be studied at the Princess Mary Maternity Hospital, which contains 90 beds, with an annual indoor and outdoor attendance on 3000 cases.

The bacteriological laboratory is adjacent to Armstrong College.

Post-graduate Instruction.—A comprehensive series of post-graduate courses have been arranged to enable practitioners to take advantage of the facilities for laboratory work and clinical study afforded by the College, the Royal Victoria Infirmary, and the Princess Mary Maternity Hospital; and in order to meet the varied requirements of practitioners there are general and special courses in the winter and summer sessions and an intensive course in the summer vacation.

A *Students' Union* has been erected and furnished at a cost of over £54,000, and is now in daily use. Special accommodation has been provided for women students.

Royal Victoria Infirmary.

The Infirmary has 576 beds. Clinical Lectures are delivered by the Physicians and Surgeons weekly and ward demonstrations are given daily. Tutorial classes are given by the Assistant Physicians, Assistant Surgeons, the Medical and Surgical Registrars, and the Assistant to the Gynæcological Department, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the Pathologist daily or as opportunity occurs, and in the new buildings nothing has been spared in perfecting scientific equipment. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching students: Ophthalmic,

Throat, Nose, and Ear, Skin, and Venereal Disease, Gynæcological, and Electrical. The hospital building contains the following laboratories: 1. Special Pathological Laboratory, attached to the post-mortem rooms. 2. Bacteriological Laboratory in which all clinical bacteriological investigations are carried out. 3. There is in addition a Clinical Laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The winter session of 1930 opens on Sept. 25th and the summer session of 1931 on April 9th. Applications for detailed information should be made to the Sub-Dean, Dr. Horsley Drummond, at the hospital.

Practical Midwifery is studied at the Princess Mary Maternity Hospital, which has 90 beds and a large extern department. Instruction is given in Psychological Medicine at the City of Newcastle Mental Hospital. A special course of instruction is given in the City Hospital for Infectious Diseases by the City Officer of Health.

Post-graduate Instruction.—1. General courses in Clinical Medicine, Surgery, and Pathology at the Royal Victoria Infirmary, meeting once weekly for ten weeks. One course will be held from October to December and one from April to June. 2. Special courses of clinical instruction, meeting once weekly for ten weeks, in the following subjects: Gynæcology; Diseases of the Eye; Diseases of the Throat, Nose, and Ear; Diseases of the Skin; Venereal Diseases; Neurology; Diseases of Children; Electrotherapeutics and Radiology; special courses in Midwifery will be held at the Princess Mary Maternity Hospital. 3. An intensive course of 14 days' duration in the early part of the Summer Vacation. 4. In addition to the regular post-graduate courses practitioners may attend the ordinary medical and surgical practice of the Royal Victoria Infirmary, and also at the Princess Mary Maternity Hospital, for specified periods.

UNIVERSITY OF BIRMINGHAM.

The University of Birmingham grants the degrees of M.B., Ch.B., M.D., Ch.M., and Ph.D. (for Research Study), and also a degree and a diploma in Public Health. The course for the Bachelors' degrees, including the subjects of Physics, Chemistry and Biology, extends over six years. The Senate has power of recognising attendance at another University as part of the attendance qualifying for these degrees and of recognising examinations passed at such other Universities as exempting from the examinations in Physics, Chemistry, Biology, and Organic Chemistry; but at least three years must be spent in attendance upon classes in the University. The final year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof. Before commencing the study of Anatomy and Physiology, examinations in Chemistry and Physics and Biology must be passed (First M.B., Ch.B., Parts I. and II.), or examination in lieu thereof. All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary, Joint Matriculation Board, 315, Oxford-road, Manchester. Second Examination.—Part I., Organic Chemistry; Part II., Anatomy and Physiology. Third Examination.—General Pathology and Bacteriology. Fourth Examinations (at the end of the fifth year).—Forensic Medicine and Toxicology; Public Health; and Materia Medica, Pharmacology, and Therapeutics. Two years' hospital work must have been accomplished. Final Examination.—Medicine, Surgery, Midwifery and Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the fourth examination will be required, also attendance at a fever hospital three months, maternity hospital three months, and mental hospital three months. Vaccination instruction must be taken and course of Ophthalmology, Venereal and Skin Diseases and Diseases of Ear, Nose, and Throat, Medica and Surgical Anatomy, and Operative Surgery. Distinctions may be awarded in the subject (severally) of the Second, Third, Fourth, and Final and First- and Second-Class Honours in the Fina Examination.

Degrees of Doctor of Medicine and Master of Surgery. At the end of one year from the date of havin passed the final M.B., Ch.B. examination the cand date will be eligible to present himself for the highe degrees of either Doctor of Medicine or Master o Surgery or both. Candidates have to present thesis on some subject embraced in the medica curriculum, and pass a general examination in Prin ciples and Practice of Medicine for the M.D. and on in Principles and Practice of Surgery, including opera tions on the cadaver, for the Ch.M., or, at the discretio of the examiners, in a special branch of Medicine o Surgery respectively. A thesis of exceptional mer may exempt from any part of these examination in which Honours may be awarded.

Degree of Ph.D.—The Degree of Doctor of Philo sophy is conferred upon candidates who possess medical degree of a British, Colonial, or other unive sity approved of by the Senate of the University, an who have been engaged, to the satisfaction of th Medical Faculty, in advanced study and research fo a period of not less than two years, either in a labora tory of the University or in one or more of the hospita associated with the University. After the first ye candidates may carry on research elsewhere, unde approved conditions, and on completing the cours present a thesis and submit themselves for oral an possibly written examination.

Scholarships and Prizes.—The following ar awarded:—Entrance Scholarships: (*a*) Frank Fletch and Catherine Fletcher Scholarships of £100 p annum each, for five years. Two or more offere annually; open to men and women students und certain prescribed conditions as to residence, &c (*b*) Sydenham Scholarship of £42, tenable for thr years, award of Council to orphan sons of medic practitioners; (*c*) Sands Cox Scholarship of £21 p annum during two years, awarded to the candidat not being more than 19 years of age, taking th highest marks at the Higher School Certificate Exam nation of the Joint Matriculation Board; (*d*) Dent Scholarship of £46 17*s.* 6*d.*, Open Competitive Examin tion in subjects learned during apprenticeshi (*e*) Myers Travelling Studentship of £300, tenable f one year, offered in alternate years, awarded by vo of committee to M.B., Ch.B. candidates, tenable some University or Hospital not in Great Britain Ireland (available for year 1930-31); (*f*) two Ingle Scholarships of £10 each, awarded to the candidat at Final Examination obtaining highest "first-class marks in the subjects of Midwifery and Diseases Women; (*g*), (*h*), (*i*), and (*j*) Four Queen's Schola ships of £10 10*s.* each, awarded to the candida taking the first place in the Second, Third, Fourth, an Final Examinations respectively, provided that t candidate's work is sufficiently distinguished; (Priestley Smith Prize in Ophthalmology, value abo £6 10*s.*, is awarded annually to the student passi the Final M.B., Ch.B. Examination on first ent who shows the best knowledge of Ophthalmolog provided the Examiners deem him worthy of th distinction. (*l*) George Henry Marshall Scholarsh of £10, awarded annually, for the encouragement Research Work in Ophthalmology; and (*m*) Russ Memorial Prize, a prize of books, value about £ awarded annually to the Student who, not being more than six years' standing as a student of th School of Medicine of the University, shall pass th best examination in the subject of Nervous Disease The "Arthur Foxwell Memorial Medal" (Gold Med for Medicine) is awarded annually to the candida taking the highest place in Clinical Medicine and pa ing the Final M.B., Ch.B. Examination in June; a

he "Sampson Gamgee Memorial Medal" (Gold Medal for Surgery) is awarded annually to the best candidates passing Final M.B., Ch.B. Examination in June in Surgery provided that not less than 60 per cent. of marks is obtained (paper, oral, and clinical). The University Clinical Board awards Gold and Silver Medals on examinations in Medicine, Surgery, and Midwifery, respectively, in fourth and fifth years, open to all students.

Clinical Instruction.—The medical students of the University receive their clinical instruction by attending the amalgamated practice of the General Hospital, Queen's Hospital, Maternity Hospital, Children's Hospital, Mental Hospital, and Fevers Hospital, under the direction of the University Clinical Board. Appointments are open to students varying from £40 to £200 a year.

Post-graduate Instruction.—A "William Withering Lectureship" has been established. A course (or courses) of lectures is given annually for post-graduates on subjects chosen from year to year. In 1931 the lectures will be given by Sir Hubert Bond, Commissioner of the Board of Control. The Ingleby Lectures on some subject in connexion with Diseases of Women and Children are given annually by specially appointed lecturers: The Lecturer for year 1931 is Prof. W. Blair Bell, of Liverpool. Post-graduate Courses of Clinical Demonstrations for General Practitioners are arranged annually (April to July) at the Birmingham General, Queen's, and Children's Hospitals.

Queen's Hospital.

There is a close association of this Hospital (330 beds) with the University of Birmingham, and the University clinical teaching is conducted here, there being a wealth of excellent material. Ward rounds and out-patient clinic classes are held daily, and there are regular tutorial classes throughout the session. Post-graduate courses arranged by the University are conducted every year. There are special departments in Gynæcology, Diseases of the Eye, of the Ear, Nose and Throat, Dentistry, Radiography, Pathology, Bacteriology, Biochemistry, Physiotherapy, and Electrocardiography. There are also large Wards for Midwifery and Postnatal cases, Nursery for instruction in Infant Welfare, an extensive Midwifery District and residential facilities for students. There are 23 Resident Appointments (exclusive of Registrars) available each year for recently qualified students.

Birmingham General Hospital.

There are 406 beds. Special wards for Children, Gynæcological, Ear and Throat, Venereal, Maternity, and Septic cases; special beds for Eye and Skin cases. Laboratories for Bacteriology, Biochemistry, Cancer Research, and Morbid Histology. Separate rooms adjoin the medical and surgical wards for clinical pathology. Five operating theatres (one for out-patients), all designed and fitted on modern lines. In addition to clinical teaching given in the wards and out-patient department by the honorary staff, medical and surgical tutorial classes are held for senior and junior students. Clinical instruction in all the special departments, which include those for Radium, Electrotherapy, Electrocardiographic investigation, and Venereal Diseases. Post-graduate classes in every branch of medicine and surgery. The Jaffray Branch Hospital contains 61 beds.

Birmingham and Midland Eye Hospital.

There are 115 beds. Students attending for a period of three months will be granted certificates which will qualify for the University and Conjoint Board examinations. Post-graduate courses are available. A limited number of Non-Resident Clinical Assistants' posts are open to qualified practitioners, particulars of which can be had on application to the General Superintendent. This Hospital has a very large Out-Patient Department.

UNIVERSITY OF LIVERPOOL.

The degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Doctor in Philosophy (Ph.D.), Master of Surgery (Ch.M.), Master of Hygiene (M.H.), and Master of Orthopædic Surgery (M.Ch.Orth.).

Matriculation.—Candidates for the degrees in Medicine and Surgery are required (*a*) to have satisfied the examiners in the several subjects of the Matriculation examination or to have passed such other examination as may from time to time be recognised for this purpose by the Joint Matriculation Board; (*b*) to have included Mathematics among the subjects in which they have passed at such examination.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 22 years on the day of graduation. At least two of the six years of medical study must have been passed in the University, and one year at least must have been passed in the University subsequently to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The subjects of the First Examination are: (1) Chemistry; (2) Biology (Zoology and Botany); (3) Physics; (4) Special Chemistry. The subjects of the Second Examination are (*a*) (1) Anatomy; (2) Physiology (including Physiological Chemistry and Histology); and (*b*) (3) Elementary Bacteriology, (4) Clinical Chemistry, (5) General Pathology. Candidates may present themselves in (*a*) or (*b*) separately. The subjects for the Final Examination are: (*a*) (1) Special Pathology and Morbid Anatomy; (2) Forensic Medicine and Toxicology; (3) Public Health; (4) Pharmacology and General Therapeutics; (*b*) (5) Obstetrics and Diseases of Women; (6) Surgery, Systematic, Clinical, Operative and Practical, including Ophthalmology; (7) Medicine, Systematic and Clinical, including Therapeutics, Mental Diseases, and Diseases of Children. Candidates may present themselves in Parts (*a*) and (*b*) separately, but candidates must have completed the fifth year of medical study before taking Part (*b*).

Degrees of Doctor of Medicine and Master of Surgery. No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has previously received the Degrees of Bachelor of Medicine and Bachelor of Surgery, and at least two years have elapsed since he passed the examinations for those degrees. Candidates may also take the degree of Doctor of Medicine by examination after five years from taking Liverpool M.B., Ch.B. Candidates for the degree of Doctor of Medicine are required (*a*) to present a thesis, acceptable to the Faculty, and certified to be the candidate's own work, together with (if the candidate desires) copies of published original papers upon Medical Science; (*b*) to present themselves for an oral examination on the subject of the thesis.

The University also awards a *Diploma in Medical Radiology and Electrology*—Part I., Physics: Part II., Radiology and Electrology. The parts may be taken at one examination or separately.

Scholarships, Fellowships, and Prizes.—The following are awarded: (*a*) Robert Gee Entrance Scholarship (Men), annually, of £42 10*s.*, tenable for four years; (*b*) Lyon Jones Scholarship, No. 1, of £21 per annum, tenable for two years, Competitive Examination among Junior Students in First M.B. Subjects; (*c*) Lyon Jones Scholarship, No. 2, of £21, Competitive Examination on results of Professional Examination in Anatomy, Physiology, Elementary Bacteriology, Clinical Chemistry, and General Pathology; (*d*) Derby Exhibition of £15, Competitive Examination in Clinical Surgery, and (*e*) Clinical School Exhibition of £15 in Clinical Medicine; (*f*) University Scholarship of £50 for

one year, awarded on results of the Final (Part A) Examination for the degrees; (*g*) Holt Fellowships, Physiology and Pathology, of £150 each, for one year; (*h*) Gee Fellowship, Anatomy, of £100, for one year; (*i*) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (*j*) Johnston Colonial Fellowship, Biochemistry, of £100, for one year; (*k*) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (*l*) Thelwall Thomas Fellowship, Surgical Pathology, of £200, for one year; (*m*) Ethel Boyce Fellowship in Gynæcology, of £100 for one year; (*n*) Mary Birrell Davies Memorial Fund Scholarship, of the value of £60, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October next following the award; (*o*) Rankin Exhibition in Practical Anatomy, of £25, for one year; (*p*) Lady Jones Research Fellowship in Orthopædic Surgery, £200; (*q*) Samuels Memorial Scholarships, three at £20; (*r*) Ridgway Research Scholarship (£100); numerous prizes and medals.

The Medical School.—All the laboratories and classrooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Experimental Medicine and Biochemistry; the Medical School for Anatomy, Surgery, Toxicology, and Ophthalmology; and the Thompson-Yates Laboratories for Physiology and Pathology. There is also a separate building for Tropical Medicine. Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation.

Clinical Studies.—The Clinical School of the University consists of four general hospitals—the ROYAL INFIRMARY, the DAVID LEWIS NORTHERN HOSPITAL, the ROYAL SOUTHERN HOSPITAL, and the STANLEY HOSPITAL; and of five special hospitals—the Eye and Ear Infirmary, the Hospital for Women (with the Samaritan Hospital), Liverpool Maternity Hospital, the Royal Liverpool Children's Hospital, and St. Paul's Eye Hospital. These hospitals contain in all a total of about 1500 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with a field for clinical education and study which is unrivalled in extent in the United Kingdom. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

UNIVERSITY OF MANCHESTER.

Four degrees in Medicine and Surgery are conferred by the Victoria University of Manchester—viz., Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine, a Diploma in Public Health, and a Diploma in Bacteriology are awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degree of M.B. or Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation, and that they have pursued the courses of study required by the University Regulations during a period of not less than five and a half years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University subsequent to the date of passing the first M.B. Examination.

The First Examination: (1) Chemistry and Physics (2) (*a*) Botany, (*b*) Zoology. Candidates must hav attended, during at least six months, courses both lectures and of laboratory work in each of the abov named subjects. The Examination is divided in two parts: Part 1, Inorganic and Elementary Organ Chemistry and Physics; Part 2, (*a*) Botany, (Zoology. The candidates sit for these par separately. The Second Examination: (1) Anaton and Histology; (2) Physiology, including Physi logical Chemistry. Both parts must be pass simultaneously. The Third Examination: (1) Pha macology and Materia Medica; (2) Pathology a Bacteriology. The Final Examination: (1) Medicin Systematic and Clinical (including Mental Diseases a Diseases of Children); (2) Surgery, Systemat Clinical, and Practical; (3) Obstetrics and Gynæcolo (including Clinical and Practical); (4) Foren Medicine; (5) Hygiene and Preventive Medicir The Final Examination is divided into two part Part I., Forensic Medicine, Hygiene and Preventi Medicine; Part II., Medicine, Surgery, Obstetri and Gynæcology (Systematic, Clinical, and Ora The two parts of the Final Examination must ea be passed as a whole. Candidates for the Second Pa must have completed the sixth year of medical stud

Degree of Doctor of Medicine.—Candidates are n eligible for the degree of Doctor of Medicine unle they have previously obtained the degrees of Bachel of Medicine and Bachelor of Surgery and at lea one year has elapsed since they passed the examinati for those degrees. Candidates may elect either (1) present an original dissertation; or (2) to under an examination. The dissertation must embody t results of personal observation or original researc either in some department of medicine or of sor science directly relative to medicine. The examin tion, which will be written and practical, is in t Principles and Practice of Medicine, in Pathology, a in some other subject to be selected by the candida

Degree of Master of Surgery.—Candidates are n eligible for the degree of Master of Surgery unless th have previously obtained the degrees of Bachelor Medicine and Bachelor of Surgery and at least o year has elapsed since they passed the examinati for those degrees. The degree is conferred in t following branches: Surgery (Branch I.), Gynæcolo (Branch II.), Ophthalmology (Branch III.), Lary gology, Otology, and Rhinology (Branch IV.).

Degrees of B.Sc. and M.Sc.—The ordinary degr of B.Sc. in the Schools of Anatomy and Physiolo may be obtained by students in Medicine who in th third year of study for the degree of M.B., Ch.B., co plete the additional courses in these subjects prescrib for this degree. Candidates for the Honours degree B.Sc. in Anatomy or Physiology, who are students Medicine, are required to attend courses in advanc Anatomy and Physiology for four terms after passi the Second Examination for the degrees of M.B., Ch. Graduates in science may proceed to the degree of M.S by presentation of an approved thesis.

Diplomas: 1. The following are available f candidates holding a registrable qualification medicine, surgery, and midwifery; examinations a in two parts in each diploma and are written, o and practical. Candidates may present themsel for Parts I. and II. separately or at the same ti provided that no candidate be admitted to Part unless he has already passed in Part I. No candidat name will be published until he has satisfied t examiners in both parts of the examination:—

(*a*) *Diploma in Psychological Medicine.*—Pa time course: extending over three University term two of which must be spent at the University. S months' residence must be spent at a recognis Hospital for Mental Diseases.

(*b*) *Diploma in Public Health.*—The cou extends over twelve calendar months at leas Part I. of the examination is held in June a October, and Part II. in March and Octob

Instruction for at least one of the parts must be taken out at the University. Holders of the Diploma in Public Health are eligible for examination for the Certificates in School Hygiene and Factory Hygiene after attending the prescribed periods of study and hospital practice.

2. *In Veterinary State Medicine.*—Length of course, three University terms. Candidates must be members of the Royal College of Veterinary Surgeons.

3. *In Bacteriology.*—For candidates who have graduated either in science or medicine, or obtained other approved qualification. Length of course, one academic year. A satisfactory thesis on an approved subject must be presented.

Scholarships, Fellowships, and Prizes.—The following are offered in connexion with medical study at the Victoria University:—Scholarships: Dreschfeld Entrance (triennial), £20; John Russell Medical Entrance, £45; Sam Gamble Entrance for Women; Graduate Entrance (fees up to 160 guineas); two Dauntesey Medical Junior, £50 each; Dauntesey Medical Senior, £50; Professor Tom Jones Exhibition in Anatomy, £25; Dickenson Trust Scholarships in Anatomy and Pathology; Platt Physiological, £90; Graduate Research Scholarship, £70; Dickenson Trust Travelling Scholarships in Medicine and Surgery; Ashby Memorial in Diseases of Children (triennial), £100; Holt Post-Graduate Medical Scholarship for Women, £60; Fellowships: Leech Research, £70; Professor Tom Jones, Surgical, £105; Morrison Watson in Anatomy, £150; John Henry Agnew in Diseases of Children, £120; Delépine in Preventive Medicine (biennial), £300; Worswick (Causes and Treatment of Rheumatoid Arthritis), £300; Zimmern Travelling Fellowship for Men, £175, also for Women; Honorary Research Fellowships. Prizes: Sidney Renshaw in Physiology, £15; Wild Prize in Pharmacology, £10; Turner Medical, two prizes each of 10 guineas; Dumville Surgical, £15; Knight Prize in Psychological Medicine, £50; John Henry Agnew in Diseases of Children, £30. There are many general entrance scholarships, in addition to those already mentioned, open for competition, the examinations for which are held in the month of May. Full particulars can be obtained from the Registrar.

The Medical School.—This school, largely extended in 1920, is provided with dissecting-rooms, X ray rooms physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, museums, and general and departmental libraries. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories (now removed to special buildings close to the Royal Infirmary) ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped as part of a new department for investigation in cancer. Ample facilities for investigation are are provided in Anatomy, Physiology, and Materia Medica; new Pharmacological Laboratories were added last year. In the public health department, which is lodged in a separate institute in York Place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the Medical School and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, mental hospitals, a convalescent home, and other special hospitals. Medical and Surgical Clinical Classes are conducted in the Infirmary, and separate instruction is afforded in the elements of Medical and Surgical Physical Diagnosis, in Obstetric Medicine, Ophthalmic Surgery, and Pathological Anatomy by the different members of the staff of the Medical School and Infirmary.

Post-graduate Studies.—Post-graduate Courses in the following subjects have been arranged for during 1930–31, in addition to those usually held at the various hospitals: 1. Whole-time intensive course in Obstetrics. 2. A Post-graduate Day. 3. Part-time courses in (i.) Diseases of the Eye, (ii.) Diseases of the Skin, (iii.) Practical Instruction in Local Anæsthesia and Minor Surgery, (iv.) Bacteriology and Immunity. 4. Clinical Assistantships. Syllabuses and other information may be obtained on application to the Dean of the Medical School, Manchester University.

Manchester Royal Infirmary.

The Manchester Royal Infirmary is built on the pavilion system, near the University, and has accommodation for 614 patients (including 54 beds at the Central Branch). The medical side consists of four units, each unit having a testing-room for the scientific investigation of morbid products and a class-room. The surgical beds are arranged in five units, each unit having its own operation theatre, with anæsthetising, recovery, sterilising, testing and apparatus rooms, and its own class-room attached. All of these units are occupied. The gynæcological, aural, and out-patient departments each have their own operating theatre. Bacteriological investigations are carried out in a special clinical laboratory. A department for the study of heart disease, with an electric cardiograph and other instruments for research, diagnosis and teaching purposes is attached to the medical wards. There is also a laboratory for clinical research. In the educational block is a large lecture theatre and a museum. In the same building is housed the X ray department, which has nine separate X ray outfits for different purposes, and in which one large room is put aside specially for X ray demonstrations and teaching purposes. A large massage school is also connected with this department.

Associated with the Infirmary are: (1) the Convalescent Hospital at Cheadle, containing 132 beds; and (2) the Central Branch in the City, which has now accommodation for 54 patients. The Associated Hospitals thus contain 800 beds and are under the same management. Women students are admitted on the same terms as men.

Two Entrance Scholarships in Medicine of the value of £160 each are offered annually by the Council of the Manchester University and the Medical Board of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. Other scholarships and prizes are mentioned in the College syllabus. Numerous annual appointments and junior appointments may be held by those who have attended the practice of the Infirmary.

Royal Manchester Children's Hospital.

The hospital, which is situated at Pendlebury, Gartside-street, Manchester, contains 190 beds and 30 in the Convalescent Home, Lytham St. Anne's. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary. There is a new Massage and Electrotherapeutic Department, also an Artificial Sunlight Department. Clinical Assistants are appointed for periods of six months. In throwing open these appointments to qualified medical men and women, the Board is actuated by the desire to aid those qualified medical men and women who wish to have opportunities for the further study of disease in children, or who wish to fit themselves for posts as Medical Officers to Children's Hospitals, to Child Welfare Centres, or for School Medical Officer appointments. There is an Orthopædic Department. Out-patients' day is on Tuesday at Gartside-street, and a ward at Pendlebury is devoted to cases needing operative treatment. Out-patients are seen daily at 9 A.M. at the Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

Ancoats Hospital, Manchester.

There are 114 beds with a Convalescent Branch of 35 beds at Great Warford, Alderley Edge, Cheshire. The hospital, founded in 1828, will be extended during the next two years by the addition of a new ward

block, an operating theatre block, pathological department, physiotherapeutic department, and lecture theatre.

The medical division consists of three units served by consultative out-patient clinics. One unit includes a cardiological department; another devotes special attention to gastro-enterology; and the third to neurology. The surgical division comprises an orthopædic unit in which all the fractures and injuries of the hospital are treated; a unit devoted particularly to urology; a unit devoted to abdominal surgery; and an oto-laryngological unit. All units include out-patient clinics. A special clinic staffed by a team consisting of surgeons, pathologist, radiologist, and consultant in radium therapy has recently been created for the study and treatment of malignant disease. The demand on the surgical in-patient accommodation is great, 800 patients at the present time being on the waiting-list. Clinical teaching is given both to undergraduate and post-graduate students in all out-patient clinics, in the wards, and in the form of special lectures. The under-graduate teaching includes a University course in Orthopædic Surgery given in the Michaelmas term, and demonstrations on the examination of the ear, nose and throat. The hospital takes an important share in the University of Manchester Post-graduate scheme. A post-graduate "day," open to all practitioners without fee, is held on each Thursday in the University terms. Special intensive post-graduate courses are held from time to time. Applications for entry to these courses should be made to the Dean of the Faculty of Medicine, University of Manchester.

There are six residents: a resident surgical officer, a resident medical officer, three house surgeons, and one house physician. These appointments are open both to men and women graduates, and are recognised by the University of London for the purposes of the M.D. and M.S. degrees. There are also four registrar appointments (part time); medical, orthopædic, surgical, and pathological. These are made annually, and are renewable up to a period of three years. General Supt. and Secretary: Herbert J. Dafforne.

Manchester Northern Hospital for Women and Children.

The hospital, situated at Park-place, Cheetham Hill-road, Manchester, contains 73 beds. Out-patients are seen daily from 8.30 to 10 A.M.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine. Courses and Degrees in the Faculty are open to men and women alike.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination. The First Examination consists of: Part I., Physics and Inorganic Chemistry; Part II., Zoology and Botany; Part III., Organic Chemistry. Candidates will be allowed to pass the parts separately. The Second Examination consists of: Part I., Materia Medica and Practical Pharmacy; Part II., Anatomy Physiology. Candidates will be allowed to pass either part separately. The Final Examination consists of: Part I., Pharmacology, Pathology and Bacteriology; Part II., Medicine, Surgery, Obstetrics, Gynæcology, and Clinical Pathology; Part III., Forensic Medicine, Public Health, and Therapeutics. Part I. may be taken at the end of the second clinical year, and Parts II. and III. may be taken at the end of the third clinical year, but not before the completion of the fifth year of medical study. If taken separately Part II. may be passed before Part III.

Degree of Doctor of Medicine and Master of Surgery.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least two years' Hospital Practice or four years' other professional practice for the former, and one year has elapsed for the latter since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine may present a dissertation and, if the dissertation is considered to be of exceptional merit, will not be required to pass an examination. The first term commences on Oct. 1st. Prospectus can be obtained from the Academic Sub-Dean.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods, or post-graduate classes held by members of the clinical staff, may do so on application to the Clinical Sub-Dean, from whom particulars may be obtained.

Clinical Studies.—The clinical studies are pursued mainly at the LEEDS GENERAL INFIRMARY, which has accommodation for 630 in-patients, including 88 beds at branch hospitals in the country. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electrotherapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. Gynæcological and Children's Departments, together with Laryngeal, Venereal, and Skin Clinics, are in operation, and there is a special ward for cases of nutritional disorders of children. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification. Further particulars concerning these, and the scholarships and prizes open to competition, may be obtained from the Dean of the Faculty of Medicine.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Mental Hospital and Leeds City Fever Hospital respectively.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board, and must pass also the further examination in Chemistry and Physics.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation, and have pursued the courses of study required by the University regulations during a period of not less than five and a half years subsequently to the date of his matriculation, three of such years at least having been passed in the Faculty of Medicine of the University one at least being subsequent to the passing of the Second Examination. The subjects of the First Examination are Chemistry, Physics and Biology. Candidates who have passed the Intermediate

Examination in the Faculty of Pure Science, including any or all of the subjects of the First Examination, will be considered to have passed the latter examination when they have passed in such of its subjects as they did not take for the Intermediate B.Sc. Examination. Such candidates shall be required to pay the fee for the First Examination. Candidates must, after matriculation, pass a preliminary examination in Physics and Chemistry before taking the First Examination, for which they must have attended courses of instruction (lectures and laboratory work) in Chemistry, Physics, and Biology for one year each. The Second Examination: Candidates must have attended courses of instruction in Physiology (first part) for one year, and in Anatomy for five terms. The Third Examination: Candidates must have attended courses of instruction in Pathology for five terms in Pharmacology for four terms (and one term in Pharmacy), in Applied Anatomy for four terms, and in Physiology (second part), for six terms. The Final Examination: The subjects are, Part I., Forensic Medicine and Public Health. Candidates must have attended courses for one term in each subject; Part II., Medicine (including Mental Diseases, Diseases of Children, and Vaccination), Special Pathology (including Morbid Anatomy and Clinical Pathology), and Therapeutics; Part III., Surgery (including the administration of Anæsthetics, Diseases of the Ear, Nose and Throat, Ophthalmology, and Surgical Pathology), and Obstetrics and Gynæcology, including Antenatal and Postnatal practice and Infant Hygiene. Candidates for Parts II. and III., must have completed a minimum of five and a half years of approved study.

Degree of Doctor of Medicine.—Candidates for the degree of Doctor of Medicine must have passed the examination for the degrees of M.B., Ch.B. at least three years previously, must present a thesis embodying observations in some subject approved by the professor of medicine, and must pass an examination in the Principles and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have taken the M.B., Ch.B. at least three years previously, and must since have held for not less than twelve months a surgical appointment in a public hospital. The subjects of examination are Systematic, Clinical, and Operative Surgery, Surgical Anatomy, Surgical Pathology and Bacteriology.

Scholarships and Prizes.—The following scholarships are offered: Four Town Trustees scholarships offered annually, each of the value of £50 per annum for three years. Medical: offered annually, covers cost of degree course in the Faculty of Medicine. Six Edgar Allen, offered annually, each of the value of £125 per annum for three years. Post-graduate: Frederick Clifford scholarship, value £50 per annum, tenable for two years. Mechanics' Institute scholarship, value £50 for one year with free admission to those University courses taken by the holder in connexion with his work, renewable for a second year. Town Trustees Fellowship, value £75 for one year. Medals and Prizes: Kaye scholarship; Gold Medal in Clinical Medicine and Surgery; John Hall Gold Medal in Pathology; Holroyd Gold Medal in Anæsthetics; the Walter S. Kay Gold Medal in Mental Diseases; bronze medals. Particulars of all the above may be obtained from the Registrar.

The Medical School.—The Medical Department occupies the entire north wing of the University quadrangle. The various athletic and other students' societies are under the management of the Union Representative Council, elected annually. There are large and comfortable common rooms both for men and women students, and two Students' Unions, one for men and one for women. A refectory is open daily at the University where students may obtain meals and refreshments at moderate prices. The University journal *The Arrows*, edited by a committee of staff and students, is published each term. The University Halls, "Oakholme," Clarkehouse-road; "Tapton Cliffe," Fulwood-road, and "Endcliffe University Hall," Endcliffe Vale-road, are recognised by the Senate as halls of residence for women students; full particulars may be obtained from the tutor for women students. Stephenson Hall is a hall of residence for men students particulars may be obtained from the Warden.

Clinical Studies.—The University is within easy reach of the various hospitals with which it is connected for clinical purposes.

The SHEFFIELD ROYAL INFIRMARY (500 beds) provides all the opportunities of a large general hospital with special departments for Skin and Ear. The SHEFFIELD ROYAL HOSPITAL, 340 beds, has special out-patient departments for Diseases of the Throat, Ear, Skin, Orthopædics, and Mental Diseases. The two institutions are amalgamated for the purposes of clinical practice, medical, surgical, and special. There are special departments for the treatment of Diseases of the Eye, with wards assigned to them, at both hospitals, and excellent junior appointments. The JESSOP HOSPITAL FOR DISEASES OF WOMEN, with 142 beds, has also a Maternity department, with about 900 in-patients per annum and about 3000 out-patient cases attended. The CHILDREN'S HOSPITAL has 92 beds. Special courses on Fevers are held at the CITY FEVER HOSPITALS (988 beds) and on Mental Diseases at the SOUTH YORKSHIRE MENTAL HOSPITAL (1900 beds). Every facility is afforded in the various laboratories for the prosecution of advanced studies and research.

Post-graduate Courses.—Post-graduate courses of clinical instruction are held annually in the various hospitals connected with the School.

UNIVERSITY OF BRISTOL.

In the Faculty of Medicine there are the following degrees:—Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S). There are also the following diplomas: Diploma in Public Health (D.P.H.), Diploma in Dental Surgery (L.D.S.), and Diploma in Veterinary State Medicine.

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass, at Matriculation standard, an examination called the School Certificate Examination, or to pass such examination as may be regarded as equivalent by the Senate. All courses, degrees, and diplomas are open to men and women.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five years after passing the first examination in Chemistry and Physics and entering on the professional curriculum at the University, or an institution recognised as equivalent, of which three shall have been passed in the University, and two of these three subsequent to passing the second examination. All candidates for the degrees of M.B., Ch.B., are required to satisfy the examiners in the several subjects of three examinations. The First Examination: The subjects of examination are: Chemistry (Inorganic), Physics, and Biology, the courses pursued being those for the time being approved for the intermediate part of the B.Sc. curriculum. This part of the curriculum shall extend over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.) The Second Examination: The subjects of examination are: Organic Chemistry and Elementary Anatomy (Part I.) and Advanced Anatomy and Physiology (Part II.). The Final Examination: The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Therapeutics, General Pathology, Morbid Anatomy, and Bacteriology (Part I.); Special Pathology, Forensic Medicine and Toxicology, Public Health, Obstetrics (including Diseases of Women),

Surgery (Systematic, Clinical, Practical, and Operative), Medicine (Systematic, Clinical, and Practical, including Mental Diseases) (Part II.). The subjects included in Part II. may be taken in two groups—viz., Group I., Surgery and Obstetrics; Group II., Medicine, Public Health, Special Pathology, Forensic Medicine and Toxicology. Candidates may pass Parts I. and II. together, or separately, and the two groups of Part II. may be taken together or separately. Forensic Medicine and Toxicology may be taken with Part I., or with Group II. of Part II.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years' standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—The degree may be taken in General Surgery or in Special Subjects. Candidates shall be Bachelors of not less than two years' standing as such. For General Surgery, they shall pass an examination in Surgical Anatomy, Pathology and Bacteriology, and in Operative, Clinical and General Surgery, and shall present a dissertation. For Special Subjects—i.e., Ophthalmology or Oto-rhino-laryngology or Gynæcology, they shall, in addition to having studied and practised for two years the subject concerned, have held an approved appointment in it for not less than six months; they shall pass a written, oral and clinical examination in the branch of Surgery concerned, as well as in the Anatomy, Physiology and Pathology of the region of the body concerned (including in the case of Ophthalmology Physiological optics) and also a written examination in the principles of General Surgery.

Clinical Studies.—The allied hospitals (BRISTOL ROYAL INFIRMARY and BRISTOL GENERAL HOSPITAL) have between them about 600 beds and extensive out-patient departments, special clinics for Diseases of Women and Children and those of the Eye, Throat and Ear, in addition to large and well-equipped departments for Dental work and large outdoor Maternity Departments.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for Morbid Anatomy. There are also laboratories for work in Clinical Pathology, Bacteriology, and Cytology, in which special instruction is given in these subjects. Departments are provided and well equipped for X ray work, both for diagnosis and treatment, the various forms of Electrical treatment, including High-frequency Currents, Electric Baths, Finsen Light treatment, and Massage.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 140 beds, and that of the Bristol Eye Hospital with 40 beds; and the Southmead Hospital, with 556 beds, may be visited.

There are numerous salaried junior appointments for residents who are graduates.

Scholarships and Prizes.—The following are awarded: The Ashworth Hallett Scholarship, value £40, open to women only; two Martin Memorial Pathological Scholarships of £10 each; the Tibbits Memorial Prize, value 7 guineas, for proficiency in practical surgery; the Committee's Gold and Silver Medals for fifth-year students for general proficiency; the Augustin Prichard Prize, value about 6 guineas, for proficiency in anatomy; the Henry Clark Prize, value 11 guineas, for proficiency in gynæcology; the Crosby Leonard Prize, value 6 guineas, for proficiency in surgery; the Suple Surgical Prize, a gold medal and 7 guineas; the Suple Medical Prize, a gold medal and 7 guineas; the Henry Marshall Prize, value £12, for dressers; the H. M. Clarke Scholarship, value £15, for proficiency in surgery; the Sanders Scholarship, value £22 10*s.*, for general proficiency; the Barrett-Roué Scholarship for proficiency in disease of the eye, ear, nose, and throat, value £17; Lady Haberfield Scholarship, value about 25 guineas.

Bristol City Senior Scholarships and those offered by the Counties of Gloucestershire, Somerset, Wilts and Dorset, and the City of Bath are tenable in the University. The Beaverbrook Fellowship and some of the Fellowships awarded by the Colston Research Society for research in the University are allotted to the Faculty of Medicine.

Post-graduate Study.—Qualified medical practitioners may be appointed as clinical assistants for a period of one or more months. They may act as assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Demonstration courses with weekly lectures are held from October to June inclusive.

All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Pathological Department, University of Bristol, who can be seen on any day by appointment.

Further information as to scholarships, curricula and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES.

The University grants Degrees in Medicine, and Diplomas in Public Health and Tuberculous Disease. Preliminary courses of study for the Degrees in Medicine may be pursued at any of the constituent Colleges of the University—viz., at Aberystwyth, Bangor, Cardiff, or Swansea. The Welsh National School of Medicine is situated in Cardiff and is an integral part of the University College of South Wales and Monmouthshire there. All classes are open to both men and women students.

Particulars may be obtained on application to the Registrar of the University of Wales, University Registry, Cathays Park, Cardiff, or the Dean of the Faculty of Medicine, or to the Secretary, Welsh National School of Medicine, Newport-road, Cardiff.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

CONJOINT EXAMINING BOARD.

Under this heading we give the regulations for the examinations enjoined by the Conjoint Examining Board of the Royal Colleges of Physicians of London and Surgeons of England, and of the Society of Apothecaries upon students desiring their respective diplomas of qualification. We do not give any list of schools recognised by these bodies as eligible to prepare students for their examinations beyond mentioning that all the schools which we have already described (under the heading of the Universities to which they are attached) are recognised as suitable places of instruction by the corporations granting medical diplomas. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

Students are required to pass a Preliminary Examination in General Education recognised by the Board and a *Pre-Medical Examination* in Chemistry, Physics and Elementary Biology conducted by the Conjoint Examining Board before commencing the five years' curriculum of professional study or some other examination recognised by the Board—namely, the examination in Chemistry, Physics, and Biology for the degree in Medicine of any University recognised by the

Board; a Pre-Medical Examination conducted by any of the Qualifying Bodies whose Degrees or Diplomas are registrable on the Medical Register; the Higher School Certificates of Oxford and Cambridge Universities, and the Oxford and Cambridge Schools Examination Board; the Higher Certificates of London, Bristol, Durham Universities, the Joint Matriculation Board of the Northern Universities, and the Central Welsh Board Higher Certificate. A candidate must enter for Chemistry and Physics together, and he will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other subject. Not more than two terms of professional study (Anatomy and Physiology) will be recognised before Elementary Biology is passed. He will be admitted to the examination on producing evidence of having passed the required preliminary Examination in General Education. The examination is partly written, partly oral, and partly practical. A candidate rejected in one or both subjects of the examination will not be admitted to re-examination until after the lapse of a period of not less than three months. The fee for the examination is £3 3*s*., for re-examination in Chemistry £2 2*s*., and re-examination in Physics £1 1*s*.

There are two Professional examinations called the *First* and *Final Examinations*. The courses of study for these examinations may be commenced before the Pre-Medical examination in Chemistry and Physics or some equivalent examination has been passed, provided that three terms of study are completed after the examination has been passed.

The subjects of the First Professional Examination are: Section I. (*a*) Anatomy, including Histology and Embryology. (*b*) Physiology, including Biochemistry. Section II. Pharmacology and Materia Medica. A candidate must have attended at a recognised Medical School courses of instruction in Anatomy, including Embryology, during five terms, during which he must have dissected the whole body, courses of instruction in Physiology, including General Biology, Biochemistry and Biophysics during five terms, courses of instruction in Pharmacology, and Materia Medica. A candidate may present himself for the two Sections together or separately, but he must take parts (*a*) and (*b*) of Section I. together until he has passed in one or both parts, but a candidate will not be allowed to pass in one part unless he obtains at the same time at least half the number of marks required to pass in the other part.

Section II. of the examination may be passed at any time before the candidate enters for the Final Professional Examination. The fee for the First Professional Examination is £10 10*s*., for re-examination after rejection in Section I. £6 6*s*., for re-examination after rejection in either part of Section I. £3 3*s*., for re-examination after rejection in Section II. £3 3*s*. A candidate who produces satisfactory evidence of having passed an examination in the subjects of Section I. or of either part of Section I. and of Section II. in the examination for the degree in Medicine conducted at a University recognised by the Board will be exempted from further examination in such subjects.

Final Professional Examination.—The subjects of the Final Professional Examination are: Section I. Pathology (including Morbid Anatomy, Morbid Histology, and Clinical Pathology), and Bacteriology. Section II. Part I. Medicine, including Medical Anatomy, Forensic Medicine and Public Health. Part II. Surgery, including Surgical Anatomy and the use of Surgical Appliances. Part III. Midwifery and Gynæcology. The examination is partly written, partly practical, partly clinical, and partly oral. A candidate may take Sections I. and II. and the three parts of Section II. of the Final Examination separately or may take the whole examination together. He will be required to produce the certificates required by the regulations before being admitted to the respective parts of the examination. The fee for admission to Section I. is £4 4*s*.; for admission to section II., Part I., £10 10*s*.; Part II., £10 10*s*.; Part III., £6 6*s*.; and the re-examination fees are respectively £3 3*s*., £6 6*s*., £6 6*s*., and £4 4*s*. Members of recognised universities outside the British Possessions are admissible to the examinations of the diplomas of L.R.C.P. and M.R.C.S., under special conditions. Graduates in medicine and surgery are required to pass the first examination and to complete 12 months hospital practice before admission to any part of the final examination. Undergraduates are required to complete the full curriculum of 33 months for the final examination after having passed the first examination. For further information see the current regulations of the Conjoint Examination Board of England.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the First Examination may present themselves for the Final Examination under special conditions. The Board also grants Diplomas in Public Health, in Psychological Medicine, in Ophthalmic Medicine and Surgery, in Tropical Medicine and Hygiene, in Laryngology and Otology, and in Gynæcology and Obstetrics. Candidates must hold a Medical qualification registrable in the United Kingdom or be Graduates in Medicine of a recognised Indian, Colonial, or Foreign University. Particulars and conditions of admission to all examinations, fees, &c., may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, London, W.C.1.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

THE MEMBERSHIP AND FELLOWSHIP.

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—The age for admission to this diploma, it will be noticed, has been changed from 25 to 23 years. The alteration in the by-law of the College is designed to enable men who have just finished house appointments to sit for an examination for which their recent clinical experience has exactly fitted them. The candidate must either have obtained the licence of the College, or a degree of Doctor or Bachelor of Medicine at a University which is registrable by the General Medical Council and is recognised by the Censors Board. The examination is directed partly to pathology and partly to the practice of medicine. Credit is also given to candidates who show a knowledge of Latin, Greek, French, or German. Further information may be obtained from the Registrar at the College. The fee for admission as a Member of the College is 40 guineas, except when the candidate for membership is a licentiate of the College, in which case the fee already paid for the licence is deducted from the 40 guineas. The fee for the examination is 10 guineas, which is reckoned as part of the fee for admission in the case of success.

Fellowship.—Fellows are selected annually from the ranks of Members by the Council of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE FELLOWSHIP.

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two Members of long standing may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the First Examination and the Second Examination. The subjects of the First Examination are Anatomy and Physiology and those of the Second Examination are Surgery, including

Surgical Anatomy and Pathology. The examinations are partly written and partly vivâ voce, and include the examination of patients and the performance of operations on the dead body. The First Examination is held in June and December and the Second Examination in May and November.

The fees for examination are: First Examination, first admission 8 guineas, and for each readmission 5 guineas. Second Examination, each admission 12 guineas. The fee payable on admission to the Fellowship by Members is 10 guineas and by non-Members 30 guineas, in addition to examination fees.

A Member of the College is admissible to the First Examination at any time after receiving his Diploma of Membership. A candidate who is not a Member is admissible after passing the First Professional Examinations of the English Conjoint Board in Anatomy and Physiology, or the equivalent examination in his University, on the production of certificates of attendance upon prescribed courses.

A Member of the College is admissible to the Second Examination at any time after having passed the First Examination on producing evidence of having been engaged not less than six years in the study (or study and practice) of the profession.

A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

The Regulations may be obtained on application to the Director of Examinations, Examination Hall, Queen-square, London, W.C.1.

SOCIETY OF APOTHECARIES OF LONDON.

The Pre-Medical and Primary examination is held quarterly. Part I. includes Chemistry, Chemical Physics; Practical Chemistry; Materia Medica and Pharmacy. Part II. includes Anatomy, Physiology, and Histology. This examination cannot be passed before the completion of twelve months' Practical Anatomy with Demonstrations, and these subjects cannot be taken separately except in the event of the candidate having previously passed in one.

The Final examination is held monthly except in September. Part I. Clinical Surgery: Principles and Practice of Surgery, Surgical Pathology, and Surgical Anatomy, Operative Manipulation, Instruments, and Appliances. Part II. Clinical Medicine: Medicine, Pharmacology, Pathology, and Morbid Histology; Forensic Medicine, Hygiene, Theory and Practice of Vaccination; and Mental Diseases. Part III. includes Midwifery, Gynæcology, and Diseases of New-born Children and the Use of Obstetric Instruments.

The course of study for the *Final examination* includes attendance on the Surgical and Medical Practice, with Post-mortem Examinations, at a hospital connected with a medical school for a period of three winter and three summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The course of medical study must extend over five years, and the office of dresser or clinical clerk must be held at a hospital or other institution recognised by the Society. Three academic years (33 months) must elapse after a candidate has passed the examination in Anatomy and Physiology before he can complete the Final examination.

Evidence shall also be given of practical instruction in Infectious Diseases and in Mental Diseases (at a lunatic asylum or in the wards of an institution containing a special ward set apart for the treatment of mental diseases), and in any two of the following subjects: Ophthalmic Surgery, Laryngology with Rhinology and Otology, Dermatology, and Diseases of Children. Candidates intending to present themselves for examination are required to give 14 days' notice. The fee for the Licence is 20 guineas. Female candidates are admitted to examinations.

Master of Midwifery—This diploma has now been instituted and the examinations are held in May and November. Candidates will be admitted to the examination who have been registered practitioners for at least one year and who have held a resident appointment in an institution recognised by the Society for six months or more, and who for three months have attended an antenatal clinic and an infant welfare centre, also recognised by the Society. Until 1932 practitioners of ten years' standing may enter for the examination without further formality than the production of satisfactory evidence that they have made a special study of the subjects. The examination will be conducted by written papers and by clinical and oral tests.

The entrance fee for the examination is £10 10*s.* and a further fee, which at present is fixed at £10 10*s.*, will be paid before their admission to the Mastery, by those who have satisfied the examiners. Candidates for the examination must send in their certificates to the Registrar, who will supply any other information.

The examination offices are open from 10 A.M. to 5 P.M.; on Saturdays from 10 A.M. to 1 P.M. All letters should be addressed to the Registrar, Society of Apothecaries of London, Blackfriars, E.C.4.

METROPOLITAN CENTRES AFFORDING POST-GRADUATE FACILITIES.

Certain organisations and institutions provide for the needs of the medical student in his curriculum and for the post-graduate student requiring special forms of instruction and opportunities for clinical observation. Many of the institutions are recognised by the English Conjoint Examining Board as a place of study for the fifth year of the curriculum.

Special Diplomas in public health, tropical, psychological, and ophthalmic medicine, medical radiology and electrology, laryngology, otology, and tuberculosis are now granted in proof of intensive work along the different lines indicated. Of these the Diploma in Public Health, being regulated by the General Medical Council, is registrable. Appointments to and promotion in the various Services are largely dependent on the possession of a particular diploma, and each syllabus of the special courses available at the institutions which follow, either with or without association with the Fellowship of Medicine, is planned to afford the necessary instruction.

The Special Diplomas are dealt with fully on p. 495, where the Bethlem Royal Hospital, the Maudsley Hospital, and the Diploma in Psychological Medicine are referred to. Similarly the Hospitals of the Metropolitan Asylums Board provide post-graduate as well as under-graduate facilities, while the hospitals of the Seamen's Hospital Society both supply the instruction necessary for the Diploma in Tropical Medicine and Hygiene, and coöperate in the activities of the Fellowship of Medicine and Post-Graduate Medical Association.

Infectious Hospitals of the London County Council

These hospitals, of which there are 18 in the metropolis and the near vicinity, were transferred on April 1st, 1930, to the Council from the Metropolitan Asylums Board, which ceased to exist on March 31st 1930, under the provisions of the Local Government Act, 1929. The Council holds classes of instruction in fevers at all the infectious hospitals at which ordinary medical students attend, but the only hospital to which a class of instruction for the diploma in public health is attached is the North-Eastern Hospital. This course of lectures and demonstrations (three months) on clinical practice and in hospital admin

stration is given at the North-Eastern Hospital, St. Ann's-road, Tottenham, N.15, by the medical superintendent, on Mondays and Wednesdays at 4.45 P.M., and alternate Saturdays at 11 A.M., beginning Wednesday, Oct. 1st. This course complies with the requirements of the revised D.P.H. regulations of the General Medical Council. Application for further information should be made to the Medical Officer of Health, London County Council, Public Health Department (Special Hospitals), Victoria Embankment, London, E.C.4.

Seamen's Hospital Society.

The Society possesses seven establishments: the Dreadnought Hospital at Greenwich, 250 beds; the Albert Dock Hospital, E.16, 53 beds; the Hospital for Tropical Diseases, Endsleigh-gardens, W.C.1, 75 beds; Tilbury Hospital, Tilbury Docks, Essex, 92 beds; Queen Alexandra Memorial Hospital, Marseilles, 60 beds; King George's Sanatorium for Sailors, Bramshott, Hants, 80 beds; and the Angas Home, Cudham, 36 beds. Total, 646 beds. It has also a Dispensary at Southampton, from which patients are transferred to the hospitals. Courses of operative surgery and surgical pathology are arranged by the London School of Clinical Medicine at the Dreadnought Hospital.

The clinical teaching of the London School of Hygiene and Tropical Medicine is given at the Society's Hospital for Tropical Diseases, Endsleigh-gardens, W.C.1.

The Fellowship of Medicine and Post-Graduate Medical Association.

Some 50 general and special London hospitals work in conjunction with this Association, which has its office at Room 28 in the House of the Royal Society of Medicine, 1, Wimpole-street, London, W. 1. Arrangements are made for courses in medicine and in surgery, occupying the whole or part of each day for periods of one to four weeks. Fees, £1 1*s.* to £7 7*s.* Special evening courses for the M.R.C.P. and F.R.C.S. (Final) Examinations are organised at intervals. Series of weekly (free) lectures (during the winter months) and clinical demonstrations in medicine and in surgery (except during August and September) are also arranged. Membership of the Fellowship is open to all qualified medical practitioners, the membership fee being 10*s.* per annum, which includes the subscription to the monthly *Post-Graduate Medical Journal*. The provisional list of Special Courses for 1931 is now available. Full information regarding the courses of study can be obtained from the Secretary.

GENERAL.

Royal Northern Group of Hospitals.

The Royal Northern Hospital, Holloway, London, N.7, is the main institution of the Royal Northern Group of Hospitals, which includes the Royal Chest Hospital, City-road, E.C., Grovelands Hospital (Recovery Branch), Southgate, and the Reckitt Convalescent Home, Clacton-on-Sea. The total number of beds in the group is 400. Besides the honorary staff there are six anæsthetists, three pathologists, resident medical officer, resident house physician, three resident house surgeons, two resident casualty officers, and one resident obstetric surgeon. The large rectangular and circular wards, each of which contains 25 beds, the children's ward for children under 5 years of age, the observation wards in the new Casualty Department, the two operation theatres, and out-patient department are designed with a view of offering the greatest facilities for clinical work. The Special Departments include the following: Fracture, genito-urinary and neurological, physico-therapeutic, pathological (under a director of clinical pathology), tuberculosis, venereal diseases, and X ray (recently remodelled). Patients are removed to the Recovery Branch by ambulance a few days after operation. Demonstrations are given daily in the wards and out-patient departments. Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments and may receive certificates at the end of their terms of office. A new maternity department has been opened, and the light department has been re-equipped. A complete hospital for paying patients is now in course of erection.

Weekly lectures by members of the hon. medical and surgical staff are free to all medical practitioners. Special classes and demonstrations are being arranged for post-graduates. They include instruction in general medicine and surgery, and also lectures and demonstrations in special subjects at the Royal Northern and Royal Chest Hospitals.

Prince of Wales's General Hospital.

This hospital, situated in Tottenham, is in the midst of a densely populated neighbourhood, and contains medical, surgical, gynæcological, and children's wards, having 200 beds. There are special departments for gynæcological cases, diseases of the eye, ear, throat, and nose, skin diseases, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction, ordinarily including laboratory classes, and lectures are given in the wards and out-patient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are six resident medical officers, and clinical assistants are appointed under certain conditions. Special intensive post-graduate courses are also held at intervals throughout the year. Further particulars in regard to the hospital may be obtained from Dr. S. C. Shanks, Secretary to the Medical Committee, 87, Harley-street, W.1; or from Mr. T. H. C. Benians, F.R.C.S., Dean of the College, at the Hospital.

West London Hospital.

This hospital has 220 beds. Attached to the hospital is the West London Post-Graduate College. The practice of the hospital is reserved exclusively for qualified men. Instruction is given in the medical and surgical out-patient rooms and demonstrations are given in the wards. Clinical assistantships are obtainable in the various general and special out-patient departments. Special classes are held in the Diseases of the Throat and Nose, Skin, and Eye, and in Gynæcology, Medical Electricity, Operative Surgery, Bacteriology, Anæsthetics, Intestinal Surgery, Medical and Surgical Diseases of Children, Blood and Urine, Clinical Microscopy, Cystoscopy, Venereal Diseases, and Operative Ophthalmology, Radiography, X Ray Therapy. The accommodation for post-graduates consists of a lecture room, together with reading, writing, and class rooms. The hospital has a fully equipped pathological laboratory. The certificate of the hospital is accepted by the Admiralty, War Office, Colonial Office, and India Office in cases of study leave. Further information can be obtained on application to the Dean, Sir Henry Simson, at the Hospital, Hammersmith, W. Secretary of the Post-Graduate College, Mr. C. Cole, and of the Hospital Mr. H. A. Madge.

London Temperance Hospital.

The hospital (Hampstead-road, N.W.) contains 136 beds. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Monday, 1.15 P.M., Tuesday, 2.30 P.M., Wednesday, 9 A.M. and 2 P.M., Thursday, 8 A.M., Friday, 10 A.M. and 3 P.M., and Saturday, 9 A.M. New Out-patient Departments for special diseases have been opened: Neurology, Diseases of the Stomach and Disorders of Digestion, Diseases of Women, Genito-urinary Diseases, Diseases of the Rectum, and Dermatology.

Hampstead General and North-West London Hospital.

In-patient Department: Haverstock Hill, N.W.; Out-patient Department: Bayham-street, Camden Town (138 beds—viz., 109 free, 8 isolation and

observation, &c., and 21 paying or contributory). Serves Hampstead and the populous districts of Kentish Town and Camden Town. The out-patients, with the exception of Hampstead casualty and emergency cases, attend exclusively at the Out-patients' Department, Bayham-street, Camden Town. Further particulars from the Secretary at the hospital. Post-graduate work is in connexion with the Fellowship of Medicine.

Queen Mary's Hospital.

This hospital has developed from the West Ham and Eastern General Hospital. It has 216 beds and ministers to a very poor public. Founded as a dispensary in 1861, and developing into a hospital in 1890, steady extensions have been made during this century. A Royal Charter was obtained in 1917, and the hospital has become a valuable charity with a full medical staff of physicians and surgeons, and specialists for gynæcology, obstetrics, ophthalmological surgery, radiology, and dental surgery. The Fellowship of Medicine and Post-Graduate Medical Association make frequent use of the opportunities here offered. A Radium Officer has recently been appointed as a supply of Radium has been sent to the Hospital by the King's Fund. The hospital has also appointed an Orthopædic Surgeon to set up a new Orthopædic Department, and in addition, a Dermatologist has been appointed to look after the new Skin Department. The number of beds has increased from 213 to 216 by virtue of the fact of the building and opening of a new Isolation Block for the Maternity Wing. Particulars may be obtained from Major Raphael Jackson, Secretary, Queen Mary's Hospital, Stratford, E.15.

NEUROLOGY.

National Hospital, Queen-square.

The hospital, with the Convalescent Home at East Finchley and branch at Clapham Park, contains 265 beds and cots. The out-patient physicians attend every Monday, Tuesday, Wednesday, Thursday, and Friday at 2 P.M., and the physicians daily. Clinical clerks are appointed under physicians and clinical assistants to out-patient physicians. Post-graduate Courses of Lectures and Demonstrations are held three times every year, usually commencing in January, May, and October, and lasting eight weeks. Special Courses in Neurological Ophthalmology, Neuropathology, and the Anatomy and Physiology of the Nervous System are given. The Pathological Laboratory is available for special work under the Pathologist.

West End Hospital for Nervous Diseases.

This institution is recognised by the University of London as a school of instruction in Neurology for the M.D. degree, Branch III., and for the D.P.M. The Out-patient Department is in Welbeck-street, W.; the In-patient Department is at Gloucester-gate, Regent's Park, and contains 80 beds. Completely equipped with pathological and other special departments, the hospital offers every facility for instruction in Neurological subjects. In conjunction with the Bethlem Royal Hospital, it offers courses of instruction for the D.P.M. Additional series of clinical demonstrations, apart from the general practice of the hospital, are held regularly each session, and the hospital coöperates with the Fellowship of Medicine in the programmes of special post-graduate teaching organised by the Association. Appointments as Hon. Clinical Assistants in the Out-patient Department are open to registered medical practitioners. The Savill Memorial Prize (value £15) and Medal are offered biennially for competition among post-graduate students who have attended the practice of the hospital or any special course. Full particulars may be obtained from Dr. C. C. Worster-Drought, Dean, or J. P. Wetenhall, Secretary, 73, Welbeck-street, W.

Hospital for Epilepsy and Paralysis.

This hospital in Maida Vale, W., contains 85 beds. Both in-patient and out-patient departments are open free to students as well as to medical graduates. The out-patient department is open every week-day except Saturday at 2 P.M.

HEART AND LUNGS.

Brompton Hospital for Consumption and Diseases of the Chest.

The hospital contains 350 beds. The recent provision of 25 (surgical) beds in a special block has increased the total number up to 350 (approximately). The sanatorium at Frimley contains 100 beds and 50 beds for paying patients. Six house physicians reside in the hospital for a term of six months; their duties include attendance in the out-patient department. An additional month may be spent at the Sanatorium. Pupils are admitted to the practice of the hospital. Clinical Demonstrations are given throughout the year by members of the medical staff. Clinical assistants are appointed to the physicians in the out-patient department and clinical clerks to the physicians in the wards. The medical practice of the hospital is recognised by the English Conjoint Board and also by the University of London, the Apothecaries' Society, and the Army and Navy and Indian Medical Boards. The hospital is open to post-graduates and students. The arrangements for post-graduate teaching have recently been revised and will now consist of special courses of one month's duration, to be held in the months of October, November, January, March, and June (fee for the month 4 guineas). Arrangements have also been made for undergraduates to work as clinical clerks in the wards and the out-patient department and to receive special instruction for one month (fee 2 guineas).

Mount Vernon Hospital.

The hospital contains 150 beds, Surgical. Clinical Demonstrations are given by the visiting Medical Staff at the hospital at Northwood. Clinical assistants are appointed to physicians in the wards. Diagnostic and follow-up departments, 14, Riding House-street, W.1.

City of London Hospital for Diseases of the Heart and Lungs.

Special Departments: Surgical, Laryngological, Radiological, Pathological, Electrocardiographic. Assistants are appointed to the Clinics, and a limited number of research workers to the Pathological Department. The in-patients staff visit generally in the afternoon; out-patients at 2 P.M. The post-graduate students are admitted on payment of fees which entitle them to attendance at clinics, post-mortem demonstrations, and operations. Special demonstration and lecture courses are provided, and a club room. Graduates desiring Assistantships in any department should address applications to the Head of that department. There is a Tuberculosis Dispensary (Boroughs of Bethnal Green and part Hackney) established at the Hospital, Victoria Park, E.2.

National Hospital for Diseases of the Heart.

The practice of the hospital (founded 1857), both in the wards and out-patient department, is open daily to post-graduates and others. Systematic courses of instruction, with lectures and clinical demonstrations, are arranged during the winter and summer sessions; in addition an intensive course, of a fortnight's duration, takes place in January, July, and October of each year. The hospital is fully equipped with all the modern instruments for the investigation of the diseases of the cardiovascular system, and facilities exist for those requiring practical instruction in electrocardiography, X rays, and other graphic methods. Clinical Assistants in the out-patient department are appointed from time to

ne. The hospital is situated in Westmoreland-reet, London, W.

DISEASES OF WOMEN AND CHILDREN.

ospital for Sick Children.

This hospital in Great Ormond-street, W.C., ntains 252 beds. The practice is open to students both sexes who have completed four years of edical study and also to qualified medical en and women. The medical staff are recog-sed by the University of London as teachers in iseases of Children. Arrangements have also en made with University College Hospital and the ndon School of Medicine for Women for the routine mission of their students of both sexes to clerkships d dresserships in the wards. Appointments are ade every three months to eight medical clerkships, nich are open to students of the hospital. Clinical struction is given daily by members of the visiting aff. Clinical Clerks are appointed once a month. the pathological department facilities are afforded post-graduates for obtaining theoretical and actical instruction in Clinical Pathology and cteriology, and in Medical Biochemistry in the thological and Biochemical Laboratories. Courses eight to ten Lecture-Demonstrations are given weekly intervals twice a year in both subjects linical Pathology and Bacteriology, and Bio-emistry.) Time spent in clerking and dressing is cognised by the Universities of London, Oxford, d Cambridge, as well as by the English Conjoint ard as part of the final curriculum. These ppointments are open to students of all recog-ed medical schools. In addition, special courses e held from time to time (generally in May and tober), as well as routine post-graduate instruction ily.

ueen Charlotte's Maternity Hospital and Midwifery Training School.

This hospital, formerly Queen Charlotte's Lying-in ospital, is situated in Marylebone-road, N.W. The spital receives over 2300 patients annually, besides ving a large out-patient department. Medical pils are received at all times of the year. Pupils ve unusual opportunities of seeing obstetric com-cations and operative midwifery on account of the ry large number of primiparous cases—nearly one-lf of the total admissions. Clinical instruction is ven on the more important cases which present emselves. They also receive valuable instruction in e Antenatal Department, where over 4000 patients tend yearly. Special Lecture-demonstrations are ven by members of the staff. Certificates of atten-nce at this hospital are recognised by all the Univer-ies, Colleges, and licensing bodies. Pupil midwives d maternity nurses are received and specially ined. A Residential College provides accommo-tion for students and qualified practitioners oth men and women), and is opposite the spital, with which it is in telephonic communi-tion.

Arrangements have been made for Medical Students receive the preliminary instruction in Practical idwifery recommended by the General Medical uncil.

oyal Waterloo Hospital for Children and Women.

This hospital, founded at the date indicated by its le, has within recent years undergone considerable tensions and has now 130 beds, while the latest ildings include a Nurses' Home, a new Operating eatre, and private pay beds. It has a full staff of rgeons, physicians, and gynæcologists, and also ecial departments. Amongst the many new ditions to the equipment of the hospital is an ectrocardiograph apparatus. A new Orthopædic partment is in use, and the Physiotherapeutic d Electrical Department has been extended and equipped. There are facilities for post-graduates to end the general and special clinics in medicine and surgery for in-patients, and for out-patients, including a genito-urinary clinic, a clinic for varicose veins, and the X ray department for gastro-intestinal diagnosis. Particulars of post-graduate courses, which are held from time to time, can be obtained from the Secretary of the Hospital, Waterloo-road, S.E., or from the Fellowship of Medicine.

Victoria Hospital for Children.

This hospital in Tite-street, Chelsea, S.W., contains 138 beds and a large out-patient department; the home at Broadstairs has 50 beds. Private wards in the Nurses' Home, named after H.R.H. Princess Mary (Viscountess of Harewood), at 29, Tite-street, adjacent to the hospital. Patients may be under the care of any medical practitioner holding an appointment on the staff of a recognised hospital, and the question of payment for his fees is arranged between him and the child's parents. Application for admission should be made to the Secretary.

Queen's Hospital for Children.

This hospital, for the sick children of the poor under 14 years of age, was formerly known as the North-Eastern Hospital for Children. There are 134 beds in London (Hackney-road, Bethnal Green, E.) and 36 at the seaside branch, "Little Folks" Home, Bexhill. Special departments in Ear, Nose, Throat, Skin and Eye, and Dentistry. Rheumatic Clinic in coöperation with L.C.C. schools weekly. A radiologist attends four times weekly. There are massage and light departments, and a special whooping-cough physician. The practice of the hospital is open to students by arrangement with the medical staff, and post-graduate instruction in children's diseases, lectures and demonstrations are given at times notified by the Fellowship of Medicine.

Paddington Green Children's Hospital.

This is a small hospital (42 beds) with a large out-patient department and a full staff, with Eye, Ear, Skin, Light, and Dental departments. The facilities which it offers for observation of clinical practice are used by the Fellowship of Medicine.

Hospital for Women.

This hospital in Soho-square, W., contains 82 beds. The teaching is available for post-graduates only in limited numbers. Operations take place daily at 2 o'clock except on Saturdays. The X ray department is supplied with the latest installation both for diagnosis and treatment, and experience can also be gained in the treatment of malignant disease by means of radium. Incorporated is the London School of Gynæcology, comprising attendance in out-patient department, operating theatre, clinical lectures, and X ray treatment.

Samaritan Free Hospital for Women.

Contains 70 beds. Qualified practitioners are admitted as clinical assistants to both the in- and out-patient departments. Full particulars may be obtained from the Secretary to the Medical Committee at the hospital, Marylebone-road, N.W.

East London Hospital for Children and Dispensary for Women.

There are 140 beds. Clinical instruction in Pediatrics is given to fifth-year Students at the hospital in Glamis-road, Shadwell, E. Two clinical clerkships for qualified or unqualified students are open every three months. Clinical assistants are from time to time appointed in the out-patient department. There is an Orthopædic Clinic on Wednesdays, and a Rheumatism Clinic on Thursdays. Special instruction in Infant Feeding. Post-graduate Clinical Demonstration on the second Wednesday in each month.

Chelsea Hospital for Women.

This hospital, situated in Arthur-street, Chelsea, S.W., has 100 beds, and a certain number are reserved for patients paying £5 5*s*. a week and small fees to the

surgeons for operations. There is a convalescent home of 32 beds at St. Leonards. At a large out-patient department the patients are seen at a nominal payment. The hospital caters for post-graduate teaching. In the out-patients' department clinical assistantships can be obtained which entitles the holder to attend out-patients and examine patients under the instruction of the visiting surgeons. The operating theatre is open to visitors, and all operations are demonstrated and discussed by the surgeons. Special intensive course, with lectures, special demonstrations, are held three times a year through the organisation of the Fellowship of Medicine.

Evelina Hospital and Belgrave Hospital.

The Evelina Hospital, Southwark (78 cots), and the Belgrave Hospital (76 cots), Clapham-road, also give facilities for out-patient practice.

OPHTHALMOLOGY.

Royal London Ophthalmic Hospital.

The attendance at Moorfields Eye Hospital (Moorfields, 1804–1899), City-road, E.C. (138 beds), is now very large. Operations are performed daily from 10 A.M. to 1 P.M., and four surgeons attend on each day. Students are admitted to the practice of the hospital, and special courses of instruction are given, which extend over a period of five months, by members of the Surgical Staff, beginning in October and March. The instruction and classes are arranged so as to meet the requirements for the various diplomas in Ophthalmology, both the preliminary examinations in Anatomy, Physiology and Optics, and those subjects required in the second part. Students of the hospital are eligible as house surgeons or clinical and junior assistants; these are appointed every three months.

Royal Westminster Ophthalmic Hospital.

This hospital, in Broad-street, Holborn, W.C. (85 beds, including 14 rooms for paying patients), has recently removed from its original site at Charing Cross to much larger premises, well adapted for teaching purposes. The clinics are held in the afternoons from 1 P.M. Operations are performed daily in the theatre at 3 P.M. Lectures and practical classes in the various branches of Ophthalmology, including Operative Surgery, Bacteriology, and Pathology, are held during the winter and summer sessions at 5 P.M. The practice of the hospital is open to both men and women practitioners, and medical students. Post-graduate students at the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction assistant (six appointments paid), and senior and junior assistants.

Royal Eye Hospital.

There are 44 beds and 2 cots at the hospital in St. George's-circus, Southwark, S.E. Clinical instruction is given to students and post-graduates daily at 2.30 P.M., and Lectures, Demonstrations, and Laboratory Classes are arranged in preparations for examinations in Ophthalmology. Apparatus has been installed for the Microscopy of the Living Eye. Post-graduate students are eligible for appointment as Clinical Assistants and as Refraction Officers. A new Clinic for paying patients under the Voluntary Hospitals Ophthalmic Clinic Scheme came into operation on July 1st.

Central London Ophthalmic Hospital.

This hospital, in Judd-street, St. Pancras, W.C., has 40 beds, and clinical teaching is given daily. Classes of instruction in the use of the ophthalmoscope, with demonstrations on cases, and also classes on other subjects, to meet the requirements of the Conjoint Board for the D.O.M.S., and of the University of London for the M.S. in Ophthalmology, are given during the winter months, commencing in October. This school is recognised as a teaching institution by the Universities of London and Oxford, as well as the English Conjoint Board. It receives a portion of the pupils of the University College Hospital for the purposes of ophthalmic training. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. A clinical Demonstration is held by members of the staff at the Central London Ophthalmic Hospital at 5 P.M. on the first Tuesday of every month. Students of medicine and doctors are admitted free.

GENITO-URINARY AND VENEREAL DISEASES.

London Lock Hospital and Home.

In the institution at Harrow-road, W., founded 1746, there are 201 beds. In the male department and out-patient department in Dean-street, Soho, W., there are 37 beds. Male and female patients are seen at 91, Dean-street, Oxford-street, W.1, at any time from 9 A.M. until 9 P.M. daily, including Sundays. Intravenous injections are given at every clinic. Irrigations for males are given daily from 8 A.M. to 9 P.M. Female patients and children are seen daily at 283, Harrow-road, Paddington, W.9, from 9 A.M. until 8 P.M. Irrigations for females are given at any time. The hospital is linked up with the Fellowship of Medicine and special courses of lectures are held in May and November each year, and application for tickets should be made direct to the Secretary of the Fellowship. Only a limited number of practitioners and students are permitted to attend the practice of the Female Lock Hospital, and application should be made to the Dean at the Male Lock Hospital between the hours of 11 A.M. and 5 P.M., or to the Secretary at the Head office, 283, Harrow-road, W. 9. Telephone No. 4035 Paddington.

St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum.

At St. Mark's Hospital for Cancer, Fistula, and other diseases of the Rectum, City-road, E.C. (founded 1835), for men and women, there are 62 general beds and 10 private beds. Operations are performed on Mondays, Wednesdays, and Thursdays at 2.30 P.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Two fortnightly courses held during year in coöperation with the Fellowship of Medicine.

St. Peter's Hospital.

At St. Peter's Hospital for Stone and other Urinary Diseases, Henrietta-street, Covent Garden (established 1860) there are 30 beds for men and 2 beds for women and children. The X ray department is diagnostic only. A loan of radium salts for research work was made by the British Empire Cancer Campaign in 1925. Medical practitioners and students are invited to the clinical instructions which are given in the out-patient department daily, excepting that the only out-patient clinic open to medical women is that held at 2 P.M. Fridays for women and children and to the operations in the theatre on Mondays at 2.30 P.M., and Wednesdays and Fridays at 2 P.M. Post-graduate Courses of Lectures are given from time to time, dates being advertised in the medical journals.

A new Pathological Laboratory and Museum will be opened shortly at 10, Henrietta-street.

All Saints' Hospital.

The in-patient department (31 beds) of the All Saints' Hospital for Genito-Urinary Diseases is at Finchley-road, and the terms of admission are free or by payment according to means. The out-patient department in the Vauxhall Bridge-road provides clinical instruction through the Fellowship of Medicine, in addition to which demonstrations in cystoscopy and other branches of genito-urinary work are available for all medical practitioners at the Out

patient Department on Wednesday, Thursday, and Saturday afternoons, at 1.30 P.M., without fee.

ORTHOPÆDICS.

Royal National Orthopædic Hospital.

This institution, situated in Great Portland-street, W. (480 beds), is a good example of the fusion of small and scattered activities for the creation of an effective whole. The three orthopædic hospitals of the metropolis were combined for the formation of this central institution at the instance of the King's Hospital Fund, with the result that the grants from this Fund and the income from subscriptions can now be used to far better purpose and with economy. The hospital has also been approved by the Ministry of Health for the treatment of tuberculosis, the connexion between orthopædics and the therapeutics required in many forms of tuberculosis having become obvious. Country branch at Brockley Hill, Stanmore (280 beds). Both branches of the hospital are residential schools for physically defective children, certified by the Board of Education. Post-graduate courses of 14 days each are held twice yearly.

EAR, NOSE, AND THROAT.

Central London Throat, Nose and Ear Hospital.

This hospital in Gray's Inn-road, W.C., is open daily to all qualified medical practitioners on presentation of their visiting cards. Demonstrations of the cases and clinical instruction are given daily by the chief surgeon of each clinic. Lectures each Friday at 4 P.M. An intensive Course of Lectures (especially suitable to D.L.O. students), with Operative Surgery Class, Peroral Endoscopy Class, and Pathology Class is given twice yearly—in May and October. Preparatory courses in methods of Examination and Diagnosis at frequent intervals. Consultations on interesting cases take place on the fourth Wednesday in each month at 4 P.M. Clinical Assistants are appointed and are expected to hold office for at least three months. They are required to attend twice weekly at 1.30 o'clock for the afternoon, and at 4.30 o'clock for the evening clinics. New wing, with complete out-patient department and additional wards, was opened in August 1929.

Golden-square Throat, Nose and Ear Hospital.

The hospital is amalgamated with the London Throat Hospital, near Piccadilly Circus, W. 1. Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 5 P.M., and on Tuesdays and Fridays from 6.30 to 9 P.M. There is an annual out-patient attendance of over 65,000. Minor operations are performed on Mondays, Wednesdays, and Fridays, at 9.30 A.M. The hospital now contains 96 beds. Practitioners and medical students are admitted to the practice of the hospital, and clinical assistants are appointed periodically.

Metropolitan Ear, Nose, and Throat Hospital.

The hospital (founded 1838) is in Fitzroy-square, W. The Out-patient Department is opened daily (Saturdays excepted) at 2.30 P.M. to all medical practitioners and senior students for acquiring clinical instruction and technical knowledge. Operations upon in-patients are performed on Tuesdays, Wednesdays, and Thursdays at 10 A.M. Clinical Assistants are appointed as vacancies occur.

SKIN.

London School of Dermatology.

The London School of Dermatology, St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C., has an in-patient Department (33 beds) at 262 Uxbridge-road, W., and out-patient Clinics are held daily at 2 and 6 P.M. (Saturdays 2 P.M. only), when demonstrations are given on the cases presenting themselves. The Chesterfield Lectures, constituting a systematic course in dermatology, are given on Tuesdays and Thursdays at 5 P.M., from October to March, by the hon. medical staff of St. John's Hospital and the physicians in charge of the Dermatological Departments of the London Teaching Hospitals. The lectures are free to those attending the practice of the hospital and to registered medical students. At the end of the course an examination is held for the Chesterfield Medal in Dermatology, and is open to all medical practitioners, the examination fee being £1 1s. The electrical department is open daily from 2 to 4 P.M., except on Wednesdays and Saturdays. Laboratory Courses in the Pathology and Bacteriology of the Skin can be arranged.

London Skin Hospital and Hospital for Diseases of the Skin.

The London Skin Hospital (Fitzroy-square) and the Hospital for Diseases of the Skin (Blackfriars-road) admit students to their practice which is among out-patients, daily at 2 P.M. and 5.30 P.M.

CENTRES OUTSIDE LONDON AFFORDING EDUCATIONAL FACILITIES.

Nearly every hospital of a general character in the country having more than 150 beds falls within this category, and certain of them have already been noticed in connexion with the universities to which their clinical practice is attached. The hospitals vary much in size and scope.

The following alphabetical list includes the provincial hospitals which are recognised by the English Conjoint Board for a part of the required training in medical and surgical practice through clerkships and dresserships.

Bath Royal United Hospital.

This hospital contains 212 beds, 72 of which are situated in Combe Park, Bath, and are for paying patients only, and possesses X ray, Massage, Bacteriological Departments, a Pathological Laboratory, and a fine library. Secretary: Mr. J. Lawrence Mears, V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), at 5 P.M., and Ear, Throat, and Nose Clinics on Thursdays, at 4 P.M.

Bedford County Hospital.

This hospital at Bedford has 124 beds, including 15 beds in the paying and 13 beds in the maternity wards, X Ray and Pathological Departments. There is in connexion with the institution a convalescent home (20 beds) at Aspley Heath, nr. Woburn Sands. The hospital is approved by the University of London for the M.D. and M.S. Examinations. Secretary: Mr. Beauchamp Wadmore.

Bradford Royal Infirmary.

This hospital at Bradford contains 215 beds and, in addition, has 50 recovery beds at the Woodlands Convalescent Home, Rawdon. There are 4 Honorary Consulting Physicians, 1 Honorary Consulting Surgeon, 1 Honorary Consulting Laryngologist, 1 Honorary Consulting Gynæcologist, 1 Honorary Consulting Pathologist, and 1 Honorary Consulting Dental Surgeon. The acting Staff consists of 4 Honorary Physicians, 4 Honorary Surgeons, 1 Honorary Radiologist, 1 Honorary Laryngologist, 1 Honorary Ophthalmic Surgeon, 1 Honorary Dental Surgeon, 2 Honorary Assistant Physicians, 2 Honorary Assistant Surgeons, 6 Anæsthetists, 1 Pathologist, 1 Physician in charge of Radium Therapy Department, 1 Resident Surgical Officer, 1 House Physician, and 4 House Surgeons. There are special clinics for Orthopædic cases, for Electrotherapeutic and Sunlight Treatment, and for Radium Therapy. A new hospital of 360 beds with a self-contained block for 70 paying patients is in construction. Secretary-Superintendent: Mr. J. J. Barron.

Coventry and Warwickshire Hospital.

There are 307 beds available at the Main Hospital at Coventry (established 1840), and 40 beds at the Alcock Convalescent Hospital, Keresley (three and a half miles distance), which is used as an annexe. At the Main Hospital there are separate Medical, Surgical, Maternity, Children's and Accident Wards, also separate Ophthalmic Block complete with its own Theatre. There are separate departments for Clinics for Ear, Nose and Throat Diseases, X Ray, Electrical, and Sunlight Clinics, also V.D. Clinic. There is also an up-to-date Pathological Laboratory.

Derbyshire Royal Infirmary.

This general hospital at Derby (346 beds) was rebuilt in 1892–94. In recent years there have been numerous alterations and additions to keep pace with modern requirements. The hospital is built on the pavilion system and provides, in addition to the usual Medical and Surgical blocks, a separate Ophthalmic block of 40 beds, a separate Children's block of 34 beds (Medical and Surgical), Gynæcological Wards, and an Ear, Throat, and Nose Department. There is a large and well-equipped Out-patient Department, also separate Orthopædic, X Ray, Electrical, Pathological, and Venereal Diseases Departments. The Honorary Visiting Staff consists of 2 Honorary Physicians, 3 Honorary Surgeons, 1 Honorary Ophthalmic Surgeon, 1 Honorary Gynæcologist, 1 Honorary Assistant Physician, 2 Honorary Assistant Surgeons, 1 Honorary Assistant Ophthalmic Surgeon, 1 Honorary Pathologist, and 2 Honorary Surgeon Dentists. The salaried Medical Staff consists of a non-Resident Staff of 1 Surgeon-in-charge of X Ray and Electrical Departments, 1 Surgeon-in-charge of Venereal Diseases Department, 4 Anæsthetists, and a Resident Staff of 4 House Surgeons, 1 House Physician, and 1 Assistant House Surgeon and Casualty Officer. Registered Medical Students are admitted to witness the medical and surgical practice on payment of fees. Superintendent and Secretary: Mr. Walter Banks, F.C.S.I.

Gloucestershire Royal Infirmary and Eye Institution.

This hospital at Gloucester has 153 beds. Secretary: F. J. Symons. An Electrical and Massage department has been established and Venereal Clinic opened. Also Ear, Nose, and Throat department, X Ray department, Ultra-violet Ray department, Orthopædic department, Dental department, and Pathological Laboratory.

Hull Royal Infirmary.

This hospital at Hull contains 272 beds, and since its establishment in 1782 has undergone steady additions and improvements, including up-to-date Ophthalmic, Radiological, Nose, Throat and Ear, Dental, V.D., Violet Rays and Pathological Departments. Recent extensions include a new Operating Theatre, Nurses' Home, and extensions to the old X Ray, Electrical, and Out-patient Departments. Work is in progress on the erection of a new 500-bed hospital at Sutton-on-Hull. The staff consists of 3 Consulting Physicians, 4 Consulting Surgeons, 3 Consulting Ophthalmic Surgeons, 3 Physicians, 4 Surgeons, 1 Ophthalmic Surgeon, 1 Aural Surgeon, 2 Radiologists, 1 Pathologist, 2 Assistant Physicians, 2 Assistant Surgeons, 1 Assistant Ophthalmic Surgeon, 1 Assistant Aural Surgeon, 1 Dental Surgeon, 1 Assistant Dental Surgeon, 4 Anæsthetists, 1 Officer-in-charge of V.D. Department. Resident Staff: 1 House Physician, 1 House Surgeon, 1 Assistant House Physician, 2 Assistant House Surgeons, 1 Assistant Surgeon to Special Departments, 1 Casualty Officer. An annexe at Withernsea has accommodation for 30 patients.

Kent and Canterbury General Hospital.

The hospital at Canterbury contains 120 beds. Pupils of the staff are admitted to the practice of the hospital. Operations daily. Special departments include Ophthalmic, Ear, Nose and Throat, Venereal, Orthopædic, Electrical, Actinotherapeutic, X Ray, and Bacteriological. Secretary: Mr. W. T. Southwood.

Leicester Royal Infirmary.

At the General Infirmary, Leicester, there are 333 beds, and at the Children's Hospital in connexion, 70; venereal diseases, 17; total 420 beds. In addition 50 beds have been retained at local convalescent homes for the reception of early recovery cases, and £330,000 spent on bringing the accommodation of the institution to a modern standard of efficiency. This scheme has included the provision of four modern operating theatres, three new wings, and self-contained out-patients' department. The Children's Hospital has been reconstructed and enlarged by the addition of a third ward at a cost of £14,500. Pathological Laboratories and post-mortem rooms were erected at a cost of £11,000, also an orthopædic out-patient department at a cost of £9500, £5000 of which was provided by the Freemasons of the province as their war memorial. The Nurses' Home has recently undergone enlargement by 60 bedrooms, and now provides for 160 nurses and staff. A large house has been purchased to accommodate the night nurses. Other recent structural improvements comprise reconstruction of the kitchens, new temporary ward of 30 beds, and a new venereal disease department. There are twelve resident salaried medical officers—viz., four house surgeons, one casualty officer, two house physicians, three anæsthetists, and two dressers. Most of the posts are filled half-yearly and afford exceptional opportunities for post-graduate experience and senior students. Dressers are given an honorarium. Students who seek resident Dressers-hips should apply to the House Governor and Secretary. A post-graduate course of lectures is arranged annually by the Leicester Medical Association, and also clinical classes are held for graduates preparing for M.D. and M.R.C.P.

Norfolk and Norwich Hospital.

This hospital at Norwich has at present 386 beds. There is a convalescent home with accommodation for 35 patients at Cromer. The Honorary Medical and Surgical Staff consist of 2 Consulting Physicians, 3 Consulting Surgeons, 1 Consulting Radiologist, 1 Consulting Ear, Nose and Throat Surgeon, 3 Physicians, 3 Surgeons, 1 Assistant Physician, 3 Assistant Surgeons, 1 Surgeon, Ear, Nose and Throat Department; 2 Ophthalmic Surgeons, 1 Radiologist, 1 Pathologist, and 2 Dental Surgeons. There are 3 Honorary Anæsthetists and Honorary Assistants to the Ear, Nose and Throat Department, the X Ray Department, Ophthalmic Department, and Cardio-Vascular Clinic. Other medical officers are: 1 Assistant Pathologist and 1 Assistant to the Venereal Diseases Department. The Resident Medical Staff consists of 1 House Physician, 3 House Surgeons, 1 House Surgeon to the Ear, Nose, Throat, and Eye Department, and 1 Casualty Officer. There is also a Private Patients' Home which has at present 14 beds, and which will shortly be increased to 20. Students are admitted to the practice of the hospital for a fee of £5 5s. for six months. House Governor and Secretary: Mr. Frank Inch.

Northampton General Hospital.

Two new wings of this hospital at Northampton were opened in 1904 and the old buildings entirely renovated and rearranged. In 1926 a new isolation block of 30 beds was opened. The number of beds is 230. There is an up-to-date Pathological Laboratory; also X Ray and Therapeutic Department and V.D. Clinic. Two new operating theatres have been built, and a new ophthalmic in-patient department is in course of construction.

North Staffordshire Royal Infirmary.

The New Infirmary, opened in 1869, at Hartshill, Stoke-on-Trent, is built on the pavilion plan, has accommodation for about 346 patients, including Children's wards, a Bacteriological and Pathological department, and a department for the treatment of Diseases of the Eye, X Ray and Electrical department (including Ultra-Violet Ray Lamps); Cardiographic

epartment, a department for the treatment of iseases of the Ear, Nose, and Throat, an Orthopædic epartment, an Electrocardiograph department, ental department, and Venereal Diseases clinics, ncluding daily Intermediate Treatments. Recent xtensions comprise a new ward block, new X Ray nd Orthopædic departments with connecting corridors the existing infirmary, large extensions to the urses' home, a new boiler house, new chimney stack, nd a new laundry. Secretary and House Governor: Ir. W. Stevenson.

ottingham General Hospital.

There are at this hospital 377 beds available for edical and surgical patients, and 54 beds are in the etached branch known as "The Cedars" Branch f the General Hospital. The Medical and Surgical taffs consist of 1 Honorary Consulting Physician, Honorary Consulting Surgeons, 1 Honorary Conulting Physician in Venereal Diseases, 3 Honorary hysicians, 4 Honorary Surgeons, 2 Honorary ssistant Physicians, 2 Honorary Assistant Surgeons, Honorary Aural Surgeons, 1 Honorary Dermatolost, 2 Honorary Anæsthetists, 2 Honorary Assistant næsthetists, 1 Honorary Surgeon Dentist, 1 Honoary Medical Officer in Charge of X Ray and Electroherapeutic department, 1 Pathologist, and 6 Clinical ssistants. The Resident Medical Staff consists of House Physicians, 4 House Surgeons, 1 Aural House urgeon, and 2 Casualty Officers. The special departents are the Ear, Nose and Throat, Skin, Dental, assage, X Ray, Orthopædic, Electrotherapeutic, ltra-Violet Light. House Governor and Secretary: Ir. P. M. MacColl.

oyal Berkshire Hospital.

This hospital at Reading, which contains 243 beds, as enlarged in 1912, 1925, and 1928, and includes n Out-patient Department, a Casualty Department, n X Ray and Radiotherapeutic Department, Electroherapeutic and Massage Department, an Orthopædic epartment, a V.D. Clinic, a Laboratory, an Eye heatre, Eye Wards, a Maternity Ward, a Nursing ome, and a Private Nursing Staff, and two Motor nd one Horse ambulances. The hospital is pproved as a Training School for Nurses, and by he Ministry of Health for V.D. Treatment. The lagrave Branch, Calcot, opened in 1930, contains 0 beds for cases of disease of bones and joints and ose requiring open-air treatment.

oyal Devon and Exeter Hospital.

The hospital at Exeter contains 225 beds (including ecial children's wards) and has a good library, useum-post-mortem room, and pathological laboary. Attendance on the practice of his hospital ualifies for all the examining boards. There is also Private Nursing Staff attached to the hospital. For articulars as to fees, &c., apply to the Matron. A ew wing was added in 1897 and the "Victory" ing for the treatment of discharged disabled soldiers nd sailors completed and opened in 1922. Doctors practice may use the museum and library. The lectrical Treatment Department, opened in 1907, as enlarged in 1925, and now forms one of the ost important sections of the hospital. At the epartment for the treatment of genito-urinary iseases there are three sessions per week, two for en at 3 P.M. and 7 P.M., and one for women at 3 P.M.

oyal Hants County Hospital.

The hospital at Winchester contains 158 civilian eds. Secretary: Mr. Herbert Maslen.

oyal Hospital, Portsmouth.

The hospital contains 190 beds. There are athological, X Ray, Massage, and Medical and urgical Out-patient departments.

oyal Hospital, Wolverhampton.

There are 240 beds. Special Departments for hildren, Infectious Cases, Gynæcology, Maternity, ar, Throat, and Nose Diseases, Electrotherapeutic and X Rays, Orthopædics, Artificial Sunlight, Venereal Disease, Pathological and Biochemical Laboratories, Dentistry, Radium, and Electrocardiograph. There is an excellent medical library. The Resident Staff consists of one House Physician, two House Surgeons, and two Casualy Officers and Anæsthetists. Women's Department, one Resident Medical Officer. Pupils are allowed to witness the whole of the practice of the hospital, and to be present at operations, and have every opportunity of acquiring a practical knowledge of their profession. The hospital is recognised by the various Examining Bodies for a part of the requisite attendance on Medical and Surgical Practice. A course of Practical Pharmacy is given by the Pharmacist. Fees on application. Applications should be made to the Honorary Secretary of the Medical Committee.

Royal Salop Infirmary.

This hospital at Shrewsbury has 150 beds. Inpatients, 1780; out-patients 1436; out-patients' attendances, 27, 519; accidents and casualties, 4374; dental cases, 278. Secretary-Superintendent: J. W. Noble. The New Wing for the reception of Women and Children is capable of accommodating some 40 patients.

Royal South Hants and Southampton Hospital.

This hospital at Southampton contains 214 beds, but will be increased to 250 beds shortly, with every facility for clinical instruction. Special Departments: Ear, Nose, and Throat; Ophthalmic; Electro-Cardiograph; X Ray; Massage and Electricity; Ultra-Violet Ray; Venereal Diseases. Large Out-patient Department.

Royal Sussex County Hospital.

This hospital at Brighton has 237 beds and affords ample facilities for students, possessing a large out-patient department, including Ophthalmic, Dental, Dermatological, Gynæcological, X Ray, and Electrotherapeutic sections, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital for any period not exceeding two years, on payment in advance of a fee, not exceeding 20 guineas, as the Board of Management shall direct.

Salisbury General Infirmary.

This hospital at Salisbury contains 159 beds. Maternity and antenatal ophthalmic wards; and Ear, Nose and Throat Wards; maternity and child welfare clinic.

South Devon and East Cornwall Hospital.

This hospital at Plymouth has 250 beds (including 10 for venereal diseases in a separate building). Special departments include Pathological, X Ray, Deep Therapy, Cardiographic, Ultra-Violet Rays, Electrotherapeutic, Orthopædic, Gynæcological and Aural; also medical and surgical out-patients. Pensioners are received as in-patients, and are also treated as out-patients.

Staffordshire General Infirmary.

This hospital was established at Stafford in 1766 and has over 100 beds; it is a Training School for Nurses.

West of England Eye Infirmary.

Students of the Exeter hospital can attend the practice of the Eye Infirmary (64 beds). A ward is set aside for newly-born babies suffering from infectious eye diseases. Mothers with babies are accommodated.

Worcester General Infirmary.

This hospital at Worcester has 132 beds. Pupils are taken by members of the Honorary Medical and Surgical Staff. New X Ray and Electrical and Wolfram Arc Light, Ear, Nose and Throat, and Orthopædic Departments have been erected and are now in use. Additional accommodation for the

Honorary Staff and Out-patients and also an Outdoor Shelter in connexion with the Children's Ward have been built as a memorial to King Edward VII., and fire-escape staircases erected. Plans have been prepared for an increase in bed accommodation to 200 beds; also Pathological Laboratory and two new Operating Theatres.

York County Hospital.

This hospital at York contains 180 beds. There are balconies for outdoor treatment, X Ray department, electrotherapeutic and massage department, actinotherapy installation, clinical laboratory, and a Zünd-Burguet apparatus for treatment of chronic deafness. There are clinics for Functional Nervous Disorders, Venereal Diseases, and Electrocardiography.

MEDICAL EXAMINING BODIES AND SCHOOLS IN SCOTLAND.

UNIVERSITY OF EDINBURGH.

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh—viz., *M.B.*, *Ch.B.*, *M.D.*, and *Ch.M.* The degree of *Ch.B.* shall not be conferred on any person who does not at the same time obtain the degree of *M.B.*, and the degree of *M.B.* shall not be conferred on any person who does not at the same time obtain the degree of *Ch.B.* No one is admitted to the degrees who has not been engaged in study for five years.

Candidates for the degrees of M.B. and Ch.B. must have attended for at least three academic years the medical and surgical practice either of the Royal Infirmary, Edinburgh, or of a general hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons. They must have attended courses of instruction in Clinical Surgery and Clinical Medicine each of nine months, and courses of instruction in all the subsidiary subjects. They must have attended a course in Clinical and Practical Midwifery and have personally conducted 12 cases.

With respect to the places and institutions at which the studies of the candidates may be prosecuted the following regulations have effect:—Three of the five years of medical study must be spent in the University of Edinburgh. The remaining two years may be spent in any University of the United Kingdom, or in any Indian, Colonial or Foreign University or medical school recognised for the purpose by the University Court. Women are admitted to graduation in medicine under the same conditions as men.

Bachelors of Medicine and *Bachelors of Surgery* may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the Military or Naval Medical Services, or in scientific work bearing directly on their profession, or two years in practice. In each case an examination must be passed and a thesis submitted.

Post-graduate Instruction.—The University takes part in the Courses given under the auspices of the Edinburgh Post-graduate Courses in Medicine. In the departments of the Faculty of Medicine provision is made for research by students of graduate standing. In the University laboratories facilities will be provided for approved candidates for the Degree of Ph.D.

In connexion with the University and Royal Colleges Post-graduate Instruction is given each year, chiefly in the Summer Vacation (July–September). Special Courses are arranged for, and particulars may be had on application to the Hon. Secretary, Post-graduate Courses in Medicine.

The University of Edinburgh is especially rich in scholarships and prizes in medical subjects. Full particulars concerning these, as well as concerning the fees at different stages, can be obtained from the Dean of the Medical Faculty.

Edinburgh Royal Infirmary.

At this institution there are 1006 beds, including 42 cots for children. The clinical work of the Edinburgh student is done at the Royal Infirmary. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Physical Diagnosis, Diseases of the Skin, Diseases of the Eye, the Ear, the Larynx and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat and Nose, and the Skin and also to cases of Incidental Delirium or Insanity. There is also a large and complete Radiological Department. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology.

The appointments are: 1. Resident physician and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physician and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department.

Facilities are given in connexion with the Post-graduate Courses arranged by the Edinburgh University and the two Royal Colleges jointly.

Royal Hospital for Sick Children.

The hospital at Sciennes-road, Edinburgh, has 132 beds, fitted with every modern improvement. A fully equipped out-patient department (medical and surgical) is conducted daily. Systematic courses of instruction, which qualify for graduation in the Edinburgh University and elsewhere, are given throughout the year by the staff. Each course consists of 50 meetings and combines medicine and surgery. Post-graduate Courses of Lectures are held during the summer vacation. Full particulars with regard to teaching can be obtained from the Dean's Office, University New Buildings, Edinburgh.

Edinburgh Eye, Ear, and Throat Infirmary.

Clinical Lectures and Instruction are given in the institution (with which is incorporated the Edinburgh Eye Dispensary) at 6, Cambridge-street, Lothian-road, open at 1 o'clock daily for out-door patients for Eye Diseases; Mondays, Thursdays, and Saturdays at 12 noon, and Tuesdays and Fridays at 4 P.M. for out-door Ear, Nose, and Throat Patients. Patients whose diseases require operations or extra care are accommodated in the house (10 beds). Practical Ophthalmoscopic Classes may be arranged, and Clinical Assistants are appointed from time to time. A Post-graduate Course in Diseases of the Ear, Nose, and Throat is held each academic term, commencing in May, October and January, and continuing for six weeks. The next course commences in October. The class meets at 5 P.M. on Tuesdays and Fridays, and the instruction, which is practical, is supplemented by lantern demonstrations. Full particulars from the Secretary, 32, Charlotte-square.

UNIVERSITY OF GLASGOW.

The University of Glasgow is both a teaching and degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university, and at least two years of the course must be taken in Glasgow University. Seven degrees, open both to men

nd women, are conferred: *M.B.* and *Ch.B.* (always onjointly), *M.D.* and *Ch.M.*; *B.Sc.* in Public Health; *D.Sc.* in Public Health; *B.Sc.* in Pharmacy; and *Ph.D.* in the Faculty of Medicine. A Diploma in Public Health (*D.P.H.*) is also granted.

All information as regards the extent and standard of the Preliminary Examination may be obtained by application to the Secretary, Scottish Universities Entrance Board, 81, North-street, St. Andrews.

For the degrees of M.B. and Ch.B. a curriculum of ive years is required. The candidate must attend a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses:—Chemistry (including Organic Chemistry), with Practical Chemistry, three terms; Physics (with practical work), one term; Botany (with practical work), one term; Zoology with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and Practical Physiology, three terms; Materia Medica nd Therapeutics (together or separately), each ubject, one term; Pathology and Practical Pathology, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one erm; Midwifery and Diseases peculiar to Women nd to Infants, two terms; Surgery two terms; Medicine, two terms. Candidates must attend for t least three years the Medical and Surgical Practice f a recognised hospital accommodating at least 0 patients and having a distinct staff of physicians nd surgeons. At least nine months' hospital attendnce is required on both Clinical Surgery and Clinical Medicine with nine months more of general hospital ractice; the student must have acted for six months s clerk in medical and dresser in surgical wards, nd must have had six months' outdoor practice; e must also have attended a course of Mental Diseases and of Practical Pharmacy (25 meetings), nust have been properly instructed in Vaccination t a public vaccination station, and must have ttended at least 20 cases of labour and the Practice f a Lying-in Hospital. The University also requires urther study in various special subjects: Ophthalmology, Diseases of the Ear, Diseases of the Throat and Nose, Venereal Diseases, Tuberculosis, Fevers, Vaccination. The final year consists of three intensive terms f study: one devoted to Midwifery and Diseases of Women, one to Surgery, and one to Medicine.

There are four Professional Examinations, the first omprising Botany, Zoology, Physics, and Chemistry; he second comprising Anatomy and Physiology; he third comprising Materia Medica and Therapeutics nd Pathology; and the fourth or final, comprising Medical Jurisprudence and Public Health, Surgery nd Clinical Surgery, Practice of Medicine and linical Medicine, and Midwifery and the Diseases eculiar to Women and to Infants.

The degrees of M.D. (*Doctor of Medicine*) *and Ch.M.* (*Master of Surgery*) are granted to candidates, not nder 24 years of age, who have previously obtained he double bachelorship on completing examinations, n Clinical Medicine for M.D. and in Surgical Anatomy, perations on the dead body, and Clinical Surgery for h.M. The higher degree of Doctor of Philosophy Ph.D.) is also conferred in the Faculty of Medicine. andidates must already have obtained a degree (or quivalent diploma) from an approved University or ollege and must prosecute a course of special study r research for two or three years and given evidence f satisfactory progress. A thesis must be presented or approval by the Senate on the recommendation f a Special Committee. The candidate may be equired to undergo an oral or other examination on he subject matter of the thesis.

Post-graduate Medical Teaching is available under he auspices of Glasgow Post-Graduate Medical Assoiation, which is representative of practically all the eaching Institutions in Glasgow. Weekly demonrations for practitioners are given throughout the winter and spring, and comprehensive courses of instruction during the summer and autumn. There is a General Medical and Surgical Course during the last two weeks of August and the first two weeks of September. This is a whole-time course and includes most of the subjects of interest to the general practitioner. The forenoons are occupied with General Medicine and Surgical Diagnosis and Minor Surgery in the Royal Infirmary and in the Victoria Infirmary. In the afternoons special subjects are dealt with in some of the special hospitals or in the special departments of the general hospitals—two subjects each afternoon. On the four Saturday forenoons Tuberculosis and Infectious Fevers are demonstrated at Ruchill Fever Hospital. Arrangements have also been made whereby a limited number of graduates may become attached to wards or out-patient departments nominally as clinical assistants for definite periods throughout the year. As such they work under the direct supervision of the physician or surgeon in charge, and carry out such detailed investigations as directed. Further information may be obtained from the Secretary of the Association, 9, Woodside-terrace, Glasgow.

There are many Bursaries, Scholarships, and Prizes in connexion with the Medical Course.

Glasgow Royal Infirmary.

The ancient connexion between the University of Glasgow and the Royal Infirmary was revived in 1911, when four University Chairs and several University Lectureships were established at the infirmary. New Lectureships in Materia Medica and Pathological Biochemistry were established recently, and a lectureship in Bacteriology has been founded. St. Mungo's College, which embraces and continues the original Royal Infirmary Medical School, is situated in the infirmary grounds. The infirmary has, including the Ophthalmic Department, over 800 beds. In addition to the large medical and surgical departments, there are special wards for diseases of women, of the throat, nose, and ear, skin, eye, burns, septic cases, and biochemical investigation. The wards are open to Women Students. Six house physicians and nine house surgeons, who board in the hospital free of charge, are appointed every six months; also five non-resident house physicians, nine non-resident house surgeons, and one non-resident dental house surgeon. Clerks and dressers are appointed by the physicians and surgeons. As a large number of cases of acute diseases and accidents of a various character are received, these appointments are very valuable and desirable. There is a modern and fully equipped Electrical Pavilion and Massage Department, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. Post-graduate Classes are held during August and September in Clinical Medicine, Clinical Surgery, Clinical Gynæcology, Diseases of the Skin, Biochemistry, Diseases of the Throat, Nose and Ear, and in Diseases of the Eye, Tutorial Classes for senior students are also held in August and September.

For information regarding fees and other particulars, application should be made to the Superintendent.

Glasgow Western Infirmary.

This hospital of 642 beds adjoins the University. Special wards are set apart for Diseases of Women, Throat, Nose, and Ear, and for Affections of the Skin. In the out-patient department there are special clinics for Diseases of Women and for Diseases of the Throat, Ear, Nose, Teeth, Skin, Venereal Disease, and Electrotherapeutics. Radium centre for Glasgow and the West of Scotland. The Clinical Courses are given by the physicians and surgeons, each of whom conducts a separate class, and students require to enter their names at the beginning of the session for the class which they propose to attend. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. All the courses of

clinical instruction are recognised by the University of Glasgow and the other boards in the kingdom. In the Pathological and Bacteriological Departments the courses are both systematic and practical, and extend through the winter and following summer; these are likewise recognised by the University for graduation. In addition Post-Graduate Courses are held. Eighteen resident assistants are appointed annually from those who have completed their course. In the Clinical Laboratory students receive laboratory instruction from the lecturer on clinical methods. A School of Massage, Medical Electricity, and Swedish Remedial Exercises has been established to qualify for the Certificate of the Chartered Society of Massage and Medical Gymnastics. Secretary: J. Matheson Johnston, C.A.

Victoria Infirmary.

This institution, situated at 67, Carlton-place, Glasgow, has 380 beds, and is the third of the extensive general hospitals in Glasgow to afford opportunity for clinical instruction to students. In addition to a full general staff there is a clinical research laboratory with pathologists and bacteriologists attached, radiological instructor, and a full assortment of specialists. The Bellahouston Dispensary, also with a clinical staff, is conducted in connexion with the Victoria Infirmary. For further particulars of the clinical practice application shoud be made to the Secretary and Treasurer.

Anderson College of Medicine.

Courses are given at Dumbarton-road, Glasgow, W., which qualify for all the licensing boards and for the Universities of Oxford, Cambridge, London, Durham, Edinburgh, and Glasgow (the latter two under certain conditions). Extensive accommodation is provided for Practical Anatomy, Practical Chemistry, Practical Botany, Practical Zoology, Practical Physiology, Practical Pharmacy, Operative Surgery, and Public Health. Ample provision has also been made for the comfort of students. Women students are admitted on the same terms as men, and the Carnegie Trust extends its benefactions to students of the College. (Full particulars may be obtained from the Carnegie Trust Offices, Merchants' Hall, Edinburgh.)

Candidates for the L.D.S. can obtain the full medical curriculum in Anatomy, Chemistry, Physiology, Surgery, Practice of Medicine, and Materia Medica. The courses special to Dentistry are conducted at the Dental Hospital, Glasgow.

Communications relating to the College to be addressed to the Secretary of the Medical Faculty. Communications relating to the Preliminary Examination in General Education to be addressed to the Educational Institute Office, 47, Moray-place, Edinburgh; and relating to the Triple Qualification and to the Dental Qualification to be addressed to Royal Faculty Hall, 242, St. Vincent-street, Glasgow.

Queen Margaret College.

Queen Margaret College (Women's Department of the University) is an integral part of the University of Glasgow. The classes are taught by professors of the University and other lecturers appointed by the University Court, and it is governed by the University Court and Senate. The curricula, regulations, and fees are the same as those of the male students, and the University degrees are open to women on the same conditions as to men. The school of medicine is a special feature of the College, and gives full preparation for the medical degrees of the University. The women students attend classes in the various University Buildings at Gilmorehill and Queen Margaret College, the Royal Infirmary, the Western Infirmary, and the Victoria Infirmary. Facilities for clinical work are given in the Royal, Western and Victoria Infirmaries, in the Maternity, Royal Sick Children's, and other hospitals. The Arthur Scholarship is open every third year to students of first year; other Bursaries are open in Arts and Medicine, and women are admitted to certain University bursaries and fellowships.

St. Mungo's College and Glasgow Royal Infirmary.

The classes in St. Mungo's College qualify for the medical qualifications of the English, Scotch, and Irish Conjoint Boards, for the dental diplomas of the English, Irish, and Scottish Boards and, under certain conditions, for the various universities, including the University of London. Students who have fulfilled the conditions of the Carnegie Trust are eligible for the benefits of this Trust during the whole course of their studies at St. Mungo's College. Further particulars can be obtained from the Secretary of the Medical Faculty.

Royal Hospital for Sick Children.

This institution consists of: (1) a hospital at Yorkhill containing 275 cots, built on an elevated and central site close to the University, and opened in July, 1914; (2) a Dispensary, or Out-patient Department, in West Graham-street, opened in October, 1888; and (3) a Country Branch at Drumchapel, Dumbartonshire, containing 80 cots, opened in 1903. Children treated must not be over 13 years of age, nor suffer from infectious diseases. In 1929 there were 5359 patients treated in the wards, and the number of attendances of out-patients was 81,960. There are one professorship and four lectureships in the University of Glasgow in connexion with the hospital, one professorship and one lectureship on the Medical Diseases of Infancy and Childhood, one lectureship on Surgery and Orthopædics in relation to Infancy and Childhood, one lectureship on Biochemistry in relation to Infancy and Childhood, and one research lectureship on the Pathology of the Diseases of Infancy and Childhood. The lectures are both systematic and clinical, but particularly and chiefly the latter. In addition, special facilities are given for post-graduate study. Resident House Physicians and Surgeons are appointed every six months at May 1st and Nov. 1st. Full information may be obtained from the Medical Superintendent.

Glasgow Royal Maternity and Women's Hospital.

The average daily number of patients in the hospital at Rottenrow is 140, and of the 4000 cases admitted to the wards per annum, over 60 per cent. are classified as abnormal. There are also about 3500 mothers attended per annum in their own homes. The work of the antenatal wards with their 40 beds is supplemented by large antenatal clinics where over 4000 new patients are seen in the course of the year. Splendidly equipped Research Laboratories were opened in 1926. The Visiting Staff of the hospital includes a Pædiatrician, who gives daily attendance. The practice of the hospital affords a wonderful field for post-graduate study and experience. In addition to the joint courses for post-graduates as organised by the Glasgow Post-Graduate Association, the resources of the hospital are always available for those who wish to make a special study of obstetrics. Inquiries should be addressed to the House Superintendent.

Glasgow Royal Samaritan Hospital for Women.

Increased to 160 beds by building extensions completed in 1927, the hospital offers excellent facilities for clinical instruction in the diseases peculiar to women. Lectures and clinical demonstrations are given by members of the surgical staff to students and to post-graduates; and the hospital is represented on the Board of the Glasgow Post-Graduate Medical Association formed for coördinating post-graduate medical teaching in all the hospitals. The Royal Samaritan Lectureship in Gynæcology is a University Lectureship associated with the hospital.

For further information, application may be made at the hospital, or to the Secretary, 200, St. Vincent-street, Glasgow.

Glasgow Lock Hospital.

The hospital at 41, Rottenrow, Glasgow, contains 80 beds for the treatment of females suffering from Venereal Diseases. There is also a Labour Ward and a well-equipped Dispensary for out-patients

attendances. There is a Lecture Room and a Laboratory, equipped with modern appliances, where University classes on the subject are dealt with. Post-graduate classes are also held. Recently the hospital has been completely renovated and modernised. Full information from the Secretary and Treasurer, Mr. J. Neilson Gray, LL.B., 65, Bath-street, Glasgow.

Glasgow Ophthalmic Institution.

This institution, at 126, West Regent-street, and 131, Wellington-street (30 beds and six cots), is administered by the Royal Infirmary. Clinical and systematic courses of lectures for students during the winter and summer sessions. Operations on Wednesdays and Fridays. Post-graduate classes and demonstrations are arranged during the summer. For information regarding fees and other particulars application should be made to the Superintendent, Royal Infirmary.

Glasgow Eye Infirmary.

The wards and dispensary at Berkeley-street and Charlotte-street are recognised by the University of Glasgow for the purpose of instruction in ophthalmology for graduation in medicine, and by the Royal Colleges of Physicians and Surgeons of England for the Diploma in Ophthalmic Medicine and Surgery. A Venereal Centre has been established, and a Branch Dispensary has been opened in Clydebank. Post-graduate Classes are held. Secretary and Acting Treasurer, Mr. William M. Moore, 171, West Regent-street, Glasgow.

Glasgow Ear, Nose and Throat Hospital.

The hospital contains 54 beds. At out-patient and indoor departments at 306, St. Vincent-street, clinical instruction is given. A Research Department has now been installed. Post-graduate Courses are held during the year. Secretary: D. N. Mackay, 38, Bath-street, Glasgow.

UNIVERSITY OF ST. ANDREWS.

Four Degrees in Medicine and Surgery are conferred by the University of St. Andrews (United College, St. Andrews and University College, Dundee)—viz., *M.B.*, *Ch.B.*, *M.D.*, *Ch.M.*, a Diploma in Public Health, and Diploma in Dental Surgery (*L.D.S.*).

The extent and standard of the Preliminary Examination is determined by the Scottish Universities Entrance Board, constituted under Ordinance No. 70 of the Scottish University Courts (General No. 3—Regulations as to Admission to the Scottish Universities for purposes of graduation), in accordance with the terms of that Ordinance. A degree in Arts or in Science in any of the Universities of the United Kingdom and in some colonial and foreign universities exempts. The Preliminary Examination for graduation in Medicine and Surgery, Arts or Science, of the University of St. Andrews is accepted as equivalent to the Registration Examination required by the General Medical Council (the certificate to include the required subjects). Also the Final Examination for a degree in Arts or Science.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A pre-registration examination is held in Physics and Chemistry. Candidates must have been engaged in medical study for at least five years. In each of the first four years the candidate must have attended at least two courses of instruction in one or more of the subjects of study specified below, each course extending over a session of not less than five months, either continuous or divided into two terms, or, alternatively, one such course along with two courses, each extending over a session of not less than two and a half months. During the fifth or final year the candidate shall be engaged in clinical study for at least nine months at the Infirmary of Dundee or at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised for the purpose by the University Court. The candidate must have received instruction in each of the following subjects of study, including such examinations as may be prescribed in the various classes—viz., Anatomy, Practical Anatomy, Chemistry, Materia Medica, Physiology, Practice of Medicine, Surgery, Midwifery, and the Diseases peculiar to Women and Infants, Pathology, Bacteriology, Practical Chemistry, Physics, Elementary Botany, Elementary Zoology, Practical Physiology, Practical Pathology, Forensic Medicine, and Public Health. The candidate must have attended for at least three years the Medical and Surgical Practice either of the Infirmary of Dundee or of a General Hospital elsewhere with not fewer than 80 patients, with a distinct staff of physicians and surgeons, and recognised for the purpose by the University Court. Additional subjects of study are Practical Pharmacy, Mental Diseases, Practical Midwifery, Operative Surgery, Vaccination, Children's Diseases, Fevers, Ophthalmology, Diseases of the Ear, Throat, and Nose, Anæsthetics, Dermatology, Venereal Diseases, Tuberculosis, and Post-mortem Examinations.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations shall have effect:—1. Two of the five years of medical study must be spent in the University of St. Andrews. 2. The remaining three years may be spent in any University of the United Kingdom or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Women are admitted to graduation in Medicine.

Professional Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery.—Each candidate will be examined both in writing and orally, and also clinically where the nature of the subject admits, in the following divisions—viz., first, in Botany, Zoology, Physics, and Chemistry; second, in Anatomy and Physiology; third, in Materia Medica, Pathology and Bacteriology, Forensic Medicine and Public Health; and fourth, in Surgery, Clinical and Operative Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and Gynæcology (Systematic and Clinical).

University College, Dundee.

The Medical School in St. Andrews University is carried on as follows. Part or whole of the medical curriculum of St. Andrews University must be taken here. Provision is made by St. Andrews University for instruction in the work of the first two years, including Anatomy and Physiology, in both St. Andrews and Dundee. The last three years of the curriculum must be taken in Dundee in University College, which is a constituent part of St. Andrews University.

Dundee Royal Infirmary.

In addition to the ordinary Medical and Surgical Wards (461 beds), there are special departments for Midwifery (In- and Out-door), for Diseases of Women, of Children, of the Eye, of the Ear, Nose, and Throat, and of the Skin; and for Clinical Pathology, Radiology, Electrotherapeusis, and Electrocardiography. A new Maternity Department is being built at a cost of £37,000. Clinical teaching is given to male and female students by the Honorary Staff; post-mortem examinations are conducted by the pathologists. All courses of instruction are recognised by the University of St. Andrews and the other Universities and Boards of the United Kingdom. Ten Resident Medical Officers are appointed every six months. Clinical clerks and dressers are attached to the Physicians and Surgeons; and Students are appointed as assistants in the pathological department. Further information may be obtained from the Medical Superintendent.

UNIVERSITY OF ABERDEEN.

The University of Aberdeen grants four degrees in Medicine and Surgery—viz., *M.D.*, *Ch.M.*, *M.B.*, and *Ch.B.* The Degree of Doctor of Philosophy (*Ph.D.*) is also granted in the Faculty of Medicine.

Degrees of M.B. and Ch.B.—Candidates, before entering on the curriculum, must have passed the Preliminary Examination or hold a qualification recognised as exempting from such examination, have attained the age of 17, and have passed the Pre-registration Examination in Physics and Chemistry.

The curriculum for the degrees extends over a period of five years, during which attendance is required in the following subjects: Botany, Zoology, Physics, Chemistry (Systematic and Practical), Anatomy (Systematic and Practical), Physiology (Systematic and Practical), Materia Medica and Therapeutics, Practical Pharmacy, Pathology (Systematic and Practical), Medical Jurisprudence, Public Health, Surgery, Medicine, and Midwifery.

Candidates must attend for at least three years the medical and surgical practice of a recognised hospital, they must have attended courses of at least nine months in clinical medicine and clinical surgery, and have acted as clerk in the medical and dresser in the surgical wards of a hospital. Attendance is required on the practice of a dispensary or the out-practice of a hospital and also on courses in Mental Diseases, Fevers, Ophthalmology, Post-mortem Examinations, Venereal Diseases, Tuberculosis, Radiology, X Ray, Therapeutics and Electrical Treatment, and Clinical Chemistry, and other special subjects. The candidate is also required to have been properly instructed in Vaccination and to have attended at least 20 Midwifery cases.

Degrees of M.D. and Ch.M.—Candidates for either of these degrees must already hold the degrees of M.B. and Ch.B. of Aberdeen. A thesis (in duplicate) has to be presented and an examination has to be passed in Clinical Medicine (or in some special Department of Medical Science) or Clinical Surgery, as the case may be.

Degree of Ph.D.—For this degree candidates must pursue a course of special study or research during a period of nine academical terms as Research Students in the University of Aberdeen or in any College or Institution that may be affiliated thereto. A Thesis (in duplicate) must be presented for approval.

A diploma in Public Health is granted by the University to graduates in Medicine of a University in the United Kingdom, after a special examination.

Scholarships and Prizes.—In the Faculty of Medicine of the University of Aberdeen there are the following Bursaries, Scholarships, and Prizes:—Bursaries: about 24 Bursaries (competition and presentation) are open each year, of £10 to £45 per annum in value, most of them being tenable for three years. Scholarships: five Post-graduate Scholarships, ranging in value up to £250 per annum. Prizes and Medals: 15 Gold Medals and Prizes for proficiency in special departments.

Aberdeen Royal Infirmary.

There are 366 beds. The main clinical work of the students is done in the infirmary with its general and special facilities, including a Department of Clinical Chemistry.

Aberdeen Royal Mental Hospital.

This hospital contains about 900 beds. The class of Mental Diseases meets at the University of Aberdeen, and clinical instruction is given at the hospital during three months in summer. Physician-Superintendent, Dr. R. Dods Brown.

Other Hospitals.

Students have the opportunity of attending the following institutions: City Fever Hospital, Sick Children's Hospital, General Dispensary, Lying-in and Vaccine Institutions, and Ophthalmic Institution.

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.[1]

CONJOINT EXAMINING BOARD.

The Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three bodies. This is the Scottish Conjoint Board. The three bodies grant their Single Licences only to candidates who already possess legal qualifications in Medicine or Surgery.

The hospitals which are recognised by the Scottish Conjoint Board as places where professional study for their diplomas can be pursued are all those institutions which feed the medical faculties of the universities, as well as all the places which are recognised by the English and Irish Conjoint Boards.

Professional Education.—The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Physics, three months; Elementary Biology, 2 terms; Elementary Organic Chemistry, one term; Anatomy, Practical Anatomy, 5 terms; Theoretical, including Biochemistry and Biophysics, 5 terms; Physiology, Materia Medica, 2 terms; Pathology (including Practical Pathology), 3 terms; Practice of Medicine, 2 terms; Clinical Medicine, 3 terms; Principles and Practice of Surgery, 2 terms; Clinical Surgery, 3 terms; Midwifery and Gynæcology, 2 terms; Diseases of Children, one term; Medical Jurisprudence, one term; and Public Health, one term. The certified attendance on lectures, demonstrations, and practical work must not be less than three-fourths of the total number of roll-calls. Every student undergoes a course of Practical Midwifery, but before attending at labours he is required to attend a course of lectures on Surgery and Midwifery and to hold the offices of Clinical Medical Clerk and Surgical Dresser. He must also attend for two and a half months' instruction in Practical Pharmacy; the certificate to be signed by the teacher, who must be a member of the Pharmaceutical Society of Great Britain, or the superintendent of the laboratory of a public hospital or dispensary, or a registered practitioner who dispenses medicines to his patients, or a teacher of Practical Pharmacy.

The student must attend for 27 months the Medical and Surgical practice of a public general hospital containing on an average at least 80 patients available for clinical instruction and possessing distinct staffs of physicians and of surgeons. He must act as Surgical Dresser and Medical Clinical Clerk for not less than nine months in the wards in each case, and receive practical instruction in administration of anæsthetics. He must attend for three months the practice of a public dispensary especially recognised by any of the above authorities, and three months' attendance at the out-patient department of a recognised general hospital. This attendance should be made after the student has passed the First and Second examinations.

Candidates are also required to attend the following three-monthly courses: Diseases and Injuries of the Eye; Insanity; Infectious Diseases; Gynæcology; Diseases of Children. The curriculum lasts for five years, the fifth year being devoted to clinical work.

There are four professional examinations:—

First Examination includes Systematic and Practical Biology, Chemistry and Physics.

The *Second Examination* must be Written, Practical, and Oral, and consist of the following subjects:—(1) Anatomy and Embryology, and (2) Physiology, including Histology (if not included in Anatomy), Biochemistry, and Biophysics. Candidates may be

[1] Regulations which apply to candidates who register as medical students after Oct. 1st were issued just before going to press.

admitted to this Examination on production of the necessary certificates of curriculum.

The *Third Examination* must be Written, Practical and Oral, and consist of the following subjects:—(1) Pathology, including Bacteriology and Morbid Anatomy, and (2) Pharmacology (Theoretical and Practical), including Pharmacological Chemistry, the Principles of Therapeutics, and Prescription Writing. Candidates may be admitted to this Examination on production of the necessary certificates of curriculum.

The *Final Examination* must consist of the following subjects[2]:—(1) Medicine, including Therapeutics, Applied Anatomy and Physiology, and Clinical Pathology with Practical Medicine; (2) Surgery, including Applied Anatomy and Physiology, Clinical Pathology, with Practical Surgery; (3) Midwifery and Diseases of Women, Clinical Obstetrics and Gynæcology, with Practical Midwifery; and (4) Medical Jurisprudence and Public Health. Medicine, Surgery, and Midwifery must be taken together, and Medical Jurisprudence and Public Health, and not earlier than on the conclusion of five Winters and five Summers of Medical Study, provided that a period of 36 months has elapsed since passing the Second Professional Examination. The Schedule for the Final Examination must contain a summary of the entire Course of Study, and, properly attested or proved by Certificates, must be lodged with the Inspector, and the fee paid, not later than one week before the examination. At the same time there must be produced a Certificate to show that the Candidate is not less than 21 years of age. No Candidate can be exempted from examination on any subject of the Final Examination (with the exception of Medical Jurisprudence and Public Health) unless he has already passed in the subject at this Board.

In addition to the Written and Oral Examinations, all Candidates must be subjected to Clinical Examinations in Medicine, Surgery, and Midwifery and Gynæcology, which shall include the Examination of Patients, Physical Diagnosis, the Clinical use of the Microscope and of other instruments, Clinical Chemistry, Surgical Appliances, Bandaging, Surface markings, Skiagrams, &c. The Oral Examination include the recognition of specimens. All Candidates for the Final Examination must complete the three portions (Medicine, Surgery, and Midwifery) within a period of 19 months.

There are four periods of examination annually.

The Registrar in Edinburgh is Mr. David Thomson, 49, George-square; and the Registrar in Glasgow, Mr. Walter Hurst, 242, St. Vincent-street, to whom fees and certificates must be sent for the respective examinations, and from whom particulars of fees can be obtained.

Edinburgh School of Medicine of the Royal Colleges.

The number of students varies much in the classes and subjects. It is within the limit to say that about 1000 students avail themselves each session of the opportunity of attending the school. The lectures qualify for the University of Edinburgh and other Universities, the Royal Colleges of Physicians and Surgeons of London, Edinburgh, and Dublin, the Faculty of Physicians and Surgeons of Glasgow, and other Medical and Surgical and Public Boards. Special courses of instruction for dental students are also included in the curriculum of this school. The practical classes and laboratories will open and the lectures commence on Oct. 1st. In accordance with the Statutes of the University of Edinburgh one-half of the qualifying classes required for graduation may be attended in this school. The regulations require that the fee for any class taken for graduation in Edinburgh shall be the same as that for the corresponding class in the University. The whole education required for graduation at the University of London may be taken in this school. Post-graduate Courses are conducted in conjunction with the University. Further particulars regarding the school, also its calendar (price 6*d.*), may be had on application to the Dean of the School, Surgeons Hall, Edinburgh.

[2] Candidates at the Final Examination may be examined on Diseases of Children, Fevers, Tuberculosis, Insanity, Skin Diseases, Diseases and Injuries of the Eye, Diseases of the Ear Throat, and Nose, Radiology. Venereal Diseases, Orthopædics, Vaccination, and Anæsthetics.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

In addition to the Diplomas granted by the Scottish Conjoint Board, the Royal College of Physicians grants its Single Licence to candidates whose names are already on the Medical Register.

The Royal College of Physicians of Edinburgh grants a *Membership* and a *Fellowship*.

Membership.—A candidate, who must be a Licentiate of a British or Irish College of Physicians, or a graduate in medicine of a University, approved by the Council, and 24 years of age, is examined in medicine, therapeutics, and in any branch of the departments of medicine specially professed, such as general pathology, psychology, public health, obstetrics, gynæcology, diseases of children, tropical medicine, or medical jurisprudence.

Fellowship.—The Fellows are selected from the ranks of the *Members*.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

The Royal College of Surgeons of Edinburgh admits to the examination for its Single Licence any candidates who hold a Diploma in Medicine of any British, Indian, or Foreign university or of any British College of Physicians, or of the Society of Apothecaries of London or Apothecaries' Hall, Dublin, granted under the provisions of the Medical Act, 1886, whose preliminary examination and course of professional study is proved to be sufficient to fulfil the requirements of the College, or to those who have passed a full examination for any of the above. Female practitioners are admitted to the Licence of the College and also to the Fellowship, and the regulations apply to practitioners of either sex.

The College grants a diploma of Fellowship after examination to the holders of British surgical degrees or diplomas and the holders of recognised degrees of the Universities of Canada, Australia, New Zealand, and the Indian Empire.

The Fellowship.—Candidates must be 25 years of age and in practice for at least two years. The examination is written and viva voce, and includes surgery and surgical anatomy, operative surgery, and clinical practice. One optional subject must also be taken, the range of these specialisms covering nearly every branch of medicine. Candidates are not allowed to appear for more than three times at the examinations. One month's notice of intention to appear for examination must be given by the candidate to the College.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The Royal Faculty of Physicians and Surgeons of Glasgow grants a Fellowship and a Licence to be held separately. The Licence is granted as a separate qualification to qualified practitioners in Medicine after examination in surgery, including surgical anatomy and clinical surgery.

Fellowship.—The Fellowship of the Faculty is granted after examination in medicine or surgery, together with an optional subject, which may be anatomy or physiology, or be selected from any special branch of medicine or surgery. Fourteen days' notice must be given by the candidate to the Faculty. In certain circumstances Fellows may be elected as a mark of distinction.

MEDICAL EXAMINING BODIES AND SCHOOLS IN IRELAND.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE (SCHOOL OF PHYSIC).

Matriculation.—University students take the Entrance of Trinity College and a Junior Freshman Term or a special Medical Preliminary; Extern Students, any examination recognised by the General Medical Council.

Pre-registration Examination in Elementary Physics and Chemistry.—Before beginning the five years' Medical curriculum students must pass an examination in elementary Physics and Chemistry. This examination is held at the end of September, in January, in March, and in July. Courses in preparation for it may be taken in the School of Physic.

Degrees in Medicine (M.B.), Surgery (B.Ch.), and Midwifery (B.A.O.).—Candidates for these degrees must be of B.A. standing and must be for at least five academic years on the books of the Medical School, reckoned from the date of registration. The Arts course may be taken concurrently with the Medical course, and the B.A. degree need not be taken before the final medical examinations, but the Medical degrees are not conferred without the Arts degree. The following courses must be attended:—(1) Botany, Zoology, Physics and Chemistry; Descriptive and Applied Anatomy; Histology, Physiology and Applied Physiology; Pathology and Bacteriology; Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Practice of Medicine; Surgery; Midwifery and Gynæcology. (2) Three courses of nine months' attendance on the Clinical Lectures of Sir Patrick Dun's or other recognised Hospital; (3) Practical Vaccination, one month's instruction; (4) Mental Disease, three months; (5) Practical Midwifery with Clinical Lectures, including antenatal and Infant Hygiene Clinics, also not less than 20 personally conducted cases, five months, one of which must be as a resident intern student; (6) Ophthalmic Surgery, three months. Three groups of examinations have to be passed. Preliminary Scientific Examination, including Physics and Chemistry, Botany, and Zoology. The Intermediate Medical, Part I., including Anatomy, Physiology, and Organic Chemistry; and Part II., including Applied Anatomy and Applied Physiology; and the Final Examination, which is divided into Part I., Materia Medica and Therapeutics, Hygiene and Jurisprudence, Pathology and Bacteriology; and Part II., Medicine, including Clinical Medicine and Mental Diseases; Surgery, including Operative and Ophthalmic Surgery; Midwifery and Gynæcology. Part I. may be passed in the fourth year, and Part II. completed at the end of the fifth.

Doctor in Medicine.—A Doctor in Medicine must have passed all the qualifying examinations and must be a B.A of three years' standing. He must also submit a thesis and pass an Examination before the Regius Professor of Physic.

Master in Surgery.—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin of not less than three years' standing and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study or study and practice of his profession. He must then pass a special examination.

Master in Obstetric Science.— A Master in Obstetric Science must be a Bachelor in Obstetric Science of two years' standing, and must produce evidence of having been engaged in the study of Obstetric Medicine and Surgery during two years. He is then required to pass a special examination.

Diploma in Gynæcology and Obstetrics.—A post-graduate diploma is conferred upon registered medical practitioners who take a six months' course at th Rotunda Hospital or other recognised institution, six months' course in Trinity College, and then pa a special examination. The minimum time require for the complete course is nine months.

Bachelor in Dental Science and Master in Dent Science.—The regulations under which these degree are awarded can be obtained by application to th Registrar of the School of Physic.

All Degrees and Courses of Instruction are open t women students.

Scholarships and Prizes.—1. Medical and Surgic Travelling Prizes, £100, awarded in alternate year 2. Bicentenary Memorial Prize, £30, awarded yearly and given to the Travelling Prizeman. 3. Sir Joh Banks Prize and Medal. 4. Edward Hallara Bennett Prize and Medal. 5. FitzPatrick Schola ship, awarded on results of Final Examinatio (interest on £1000). 6. Medical Scholarship, £2 per annum for two years, awarded in Chemistry Physics, Botany, and Zoology. 7. Medical Schola ship in Anatomy and Physiology, £20 per annum fo two years. 8. Henry Hutchinson Stewart Schola ships, one in Botany, Zoology, Chemistry an Physics, and another in Anatomy and Physiology awarded annually and valued at £10 per annum fo three years. 9. Henry Hutchinson Stewart Schola ship in Mental Diseases, awarded from time to time £50 per annum for three years. 10. John Malle Purser Medal, awarded annually in Physiology 11. Daniel John Cunningham Medal and Prize awarded annually in Anatomy. 12. Begley Student ship, £40 per annum for four years, awarde annually. 13. Kingsmill Jones Memorial Prize awarded annually in Natural and Experimenta Science, £15. 14. O'Sullivan Memorial Scholarship £48 awarded annually for excellency of record i school.

Post-graduate Instruction.—Arrangements have bee made, with the approval of the Board of Trinit College, for a post-graduate course of instruction a the School of Physic during the autumn from Monday Sept. 15th, to Saturday, Oct. 4th. A limited numbe of members of the class can reside in college room and dine on commons. Women graduates can b accommodated at Trinity Hall.

HOSPITALS AFFORDING RECOGNISED PRACTICE.[1]

The following hospitals afford practice recognise by the Irish Universities and Corporations.

Sir Patrick Dun's Hospital.

Classes both in Medicine and Surgery are held eac morning at Grand Canal-street, Dublin, from 9 o'cloc from Oct. 1st till the end of June. Special classe for junior students will be held in the wards durin the months of October, November, and December A Resident Surgeon, with salary, is appointed annually Six Resident Pupils are appointed every six months Twelve surgical Dressers and twelve Clinical Clerk are appointed each month. There are facilities fo women students.

The practice of the hospital is open to all students and the certificates are recognised by Dublin Univer sity, the National University, and Royal Colleges o Surgeons of England, Ireland, and Scotland. It i an official "Treatment Centre" for venereal diseases

Prizes and Medals.—Clinical medals and prize amounting to about £21 each will be awarded i Medicine and in Surgery respectively in accordanc with the will of the late Rev. Samuel Haughton, M.D.

[1] This list of the institutions recognised by the Conjoin Board of Ireland is supplemented in the regulations of th Colleges by those hospitals mentioned as recognised institu tions in Scotland and England. The recognised facilities fo clinical instruction in some of the Irish centres have bee described.

S.F.T.C.D. Candidates who fail to obtain these medals and prizes will be awarded special certificates in Medicine and Surgery provided they show sufficient merit.

Further information will be supplied by the Hon. Secretary to the Medical Board.

Adelaide Hospital.

Two Resident Surgeons and four or more Resident pupils are elected every six months.

Prizes.—The Hudson Scholarship, £30 and a Gold Medal, as well as the Hudson Prize, £10 and a Silver Medal, are awarded at the end of the session for proficiency in medicine, surgery, gynæcology, and pathology. In addition to this prizes are awarded in gynæcology and dermatology, and in clinical medicine and surgery for junior students. Three Wallace Beatty Memorial Bursaries are granted at the discretion of the Medical Board at the beginning of the Winter session. The certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom.

Further particulars may be obtained from the Secretary of the hospital, Peter-street, Dublin.

Mater Misericordiæ Hospital.

This hospital, under the care of the Sisters of Mercy, containing 410 beds, is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given by the Physicians and Surgeons at 9 A.M. daily. Ophthalmic Surgery is taught in the Special Wards and in the Dispensary. Surgical operations are performed daily. Connected with the hospital are extensive Dispensaries, which afford valuable opportunities for the study of general Medical, Dermatological, Surgical Diseases, and Accidents; a fully-equipped Biochemical Laboratory, a modern Electro-Massage Department, an Electrocardiograph room, and Radiological Department. Instruction is given on Pathology and Bacteriology. Three House Physicians, eight House Surgeons, and 18 Resident Pupils are elected annually. Dressers and Clinical Clerks are appointed regularly and certificates given for merit. Leonard Prizes will be offered for competition annually. Certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. There is a Private Hospital for the reception of Medical and Surgical cases. A Training School and a Home for Trained Nurses are connected with the Hospital, and Nurses who have passed a qualifying examination can be obtained on application to the Lady Superioress.

Entries can be made with any of the physicians or surgeons, or with the Registrar, 31, Fitzwilliam-square, Dublin. Detailed information may be obtained from the Secretary, Medical Board.

Mercer's Hospital.

This hospital contains 120 beds for medical and surgical cases, and arrangements have been made with the medical officers of Cork-street Fever Hospital whereby all students of this hospital are entitled to attend the clinical instruction of that institution and become eligible for the resident posts. There is a large dispensary for out-patients and a modern X ray department. An electrocardiograph has been installed. Students of the hospital are permitted to attend the gynæcological department, where they receive practical instruction. There are special wards for the treatment and study of children's diseases. A gold medal is awarded annually to the best student. During the past few years the hospital has undergone extensive alterations in order to bring it up to modern requirements. A House Surgeon and a House Physician is appointed annually. There are six men and two women Resident Pupils, and Clinical Clerks and Dressers are appointed from members of the classes.

For further particulars apply to Dr. Leonard Abrahamson, Hon. Sec., Medical Board, 40, Fitzwilliam-place, Dublin.

Richmond, Whitworth, and Hardwicke Hospitals.

These House of Industry hospitals at Dublin contain 330 beds—130 for Surgical Cases, 80 for Medical Cases, 78 for Fever and other Epidemic Diseases, and an Auxiliary Wing with 42 beds, devoted mainly to throat, nose and ear, and skin diseases. Two Resident Physicians and two Resident Surgeons are appointed each half year, in addition to a Resident Pathologist and a Resident Anæsthetist. Resident Clinical Clerks are appointed each quarter, and it has always been the aim of the Medical Board to ensure that each student spends at least six months in residence. Women students are eligible on the same terms as men. Ample facilities exist for post-graduate work in the various special departments, as well as in general medicine and surgery. Extensive alterations and improvements have recently been made in the X Ray, Electrotherapeutic, and Electrocardiographic departments.

For further information apply to Hon. Secretary, Medical Board.

Royal City of Dublin Hospital.

The hospital contains 158 beds and a special wing for the treatment of fevers and contagious diseases founded by the late Mr. Drummond. There is a large nursery where special opportunities are afforded for the study of diseases of children, both medical and surgical. There are also special wards for ophthalmic, aural, and gynæcological cases; also a department for the Erlangen Treatment by Deep Therapy. There is a largely attended out-patient department, where students are allowed to attend accidents and dress cases under supervision. Six resident pupils are appointed every three months. A House Surgeon and a House Physician are appointed annually.

For information apply to the Secretary.

Dr. Steevens' Hospital.

This hospital, at Dublin (Kingsbridge), contains 250 beds, of which 175 are now in use. There is accommodation for 10 resident pupils, each of whom is provided with a separate bedroom, and board is supplied by the hospital at a reasonable rate. There is an Electric Massage Department, a "Sun-Ray" and Diathermy Department, and an X ray Department. There are also two V.D. wards and a largely attended V.D. Treatment Centre, as well as a large empty ward re-equipped and opened as open-air ward for Tuberculous and other diseases of bone, 25 beds.

All information with regard to the terms for such residency can be had from the Resident Surgeon at the Hospital. Secretary: E. D. F. Banks.

Meath Hospital and County Dublin Infirmary.*

Jervis-street Hospital, Dublin.*

Rotunda Hospital.

The Rotunda Hospital, Dublin, is the largest combined gynæcological and maternity hospital in the British Empire. Over 4000 confinements are attended annually, and upwards of 1000 gynæcological patients admitted. Students can take out their necessary gynæcological and midwifery practical courses. The work of the hospital is carried on continuously through the year, and consists of daily clinical instruction in the maternity department, and examination and operations in the gynæcological department. Qualified students are given facilities for studying and assisting in the management of all abnormal cases so far as is practical. An antenatal dispensary is held three times weekly and all students are encouraged to attend. A special class in gynæcological examination and diagnosis is conducted by the Assistants to the Master. In addition there is a special class in operative obstetrics, limited in number. The pathological laboratory is under the supervision of a skilled pathologist, who gives special classes at intervals. There is a fully equipped X ray installation under the care of a competent radiologist.

* No returns.

A ward has been opened for the treatment of infantile conditions, and is under the care of a pædiatrician, who gives instruction in the out-patient department, which is held daily. The appointments on the staff of the hospital are given to qualified past students of the hospital who have taken the L.M., and consist of Extern Assistants for six months, one being appointed every three months. From these the Assistants to the Master are appointed. Women students can reside in the hospital on the same terms as men. The mess room and sleeping quarters have been decorated recently and reading rooms are provided. The L.M. is granted by examination after a six months' course. Fees for Intern students: one month £6 6*s*., months other than the first £4 4*s*., three months £12 12*s*., six months £21. Special gynæcological class £2 2*s*. per month.

For further particulars apply to the Master, Dr. Bethel Solomons, F.R.C.P.I.

Coombe Lying-in Hospital.

The Coombe Lying-in Hospital and Guinness Dispensary for the Treatment of Diseases peculiar to Women, Dublin, contains 70 beds, and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. Lectures are delivered, practical instruction given, and gynæcological operations are performed in the theatres daily. There is a general dispensary held daily, at which instruction is given on the Diseases of Women and Children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynæcology is given. There is no extra charge for attendance at this Dispensary. There is accommodation for intern pupils, who enjoy exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Women students can reside in the hospital. Clinical assistants are appointed from amongst the pupils as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Students can enter for attendance at any time, but preference is given to those entering from the first day of the month.

Further particulars may be had on application to the Master or the Registrar at the Hospital.

National Maternity Hospital.

This hospital at Holles-street, Dublin, was established in 1894. The hospital consists of Intern and Extern Maternity, Gynæcological Wards, and a Dispensary for the treatment of Diseases of Women and Children and an antenatal and postnatal branch. Every facility is given for the carrying out of practical work. Undergraduate and post-graduate courses are arranged at any time. Certificates of attendance at this hospital are recognised by all the licensing bodies. Clinical lectures are given daily and Oral lectures four times per week. The L.M. Diploma is given by special examination, which is held three times a year.

Further particulars can be obtained from P. T. McArdle, Esq., M.B., the Master, or from the Secretary, Holles-street, Dublin.

St. Vincent's Hospital and Dispensary.

This hospital was established at Dublin in 1834, with 200 beds. Clinical Lectures in Medicine and Surgery are held from October to June. Special classes for Juniors from October to December. Pathological and Bacteriological Demonstrations are given every Thursday, and instructions in the use of Laryngoscope and Otoscope for senior students every Saturday. Medals and Prizes: the Bellingham gold medal in Medicine and the O'Ferrall gold medal in Surgery are offered for competition at the end of the summer session, as well as junior prizes, also the McArdle Memorial Prize, value £20. There are a large Extern Department and a new Pathological Laboratory.

Further particulars from Hon. Secretary Medical Board, Wm. Doolin, M.B., F.R.C.S., 2, Fitzwilliam-square, Dublin.

NATIONAL UNIVERSITY OF IRELAND.

Matriculation.—All students must pass a matriculation examination; the examination taking place in June and September in Dublin, and at certain local centres, includes five subjects, three of which must be Irish, English, and mathematics. All students must pass in Irish except students not born in Ireland, and other students whose home residence shall have been outside Ireland during the three years immediately preceding their matriculation; but all such students will be expected to attend a course of instruction in Irish Literature and History prior to obtaining any degree in the University. The following are the subjects for examination:—(1) Irish. (2) Latin. (3) Greek. (4) French. (5) German. (6) Italian. (7) Spanish. (8) Portuguese. (9) Welsh, or any other modern language approved by the Senate. (10) English. (11) Mathematics. (12) History. (13) Geography. (14) Applied Mathematics, or (15) Physics as an alternative. (16) Chemistry. (17) Botany. (18) Agricultural Science. (19) Commerce. (20) Music, and for women candidates only (21) Physiology and Hygiene. Students entering for degrees in Medicine or Dentistry, if not already registered by the General Medical Council, must take Irish, Latin, English, Mathematics, and a fifth subject.

The medical degrees granted are:—

M.B., B.Ch., B.A.O.; M.D., M.Ch., M.A.O., Ph.D.—Printed forms of application for admission to any medical examination may be had from "The Registrar, The National University of Ireland, Dublin."

The Constituent Colleges of the National University of Ireland at which the full curriculum for medical degrees can be obtained are University College, Dublin; University College, Cork; and University College, Galway.

University College, Dublin.*

Matriculation.—Almost all the students of the College are matriculated students of the National University of Ireland. The pre-registration examination in physics and chemistry is taken after matriculation either at the beginning of or during the winter session. The course is of five years' duration and dates from the passing of the pre-registration examination.

Degrees of M.B., B.Ch., and B.A.O.—The First Examination includes Applied Physics, Applied Chemistry, Botany, Zoology, and Applied Biology. The examination may be taken in two parts: Part I., Physics and Chemistry; Part II., Botany and Zoology. Honours may be obtained only when both parts are taken as one examination. The Second Examination includes Anatomy and Physiology. Both must be passed at the same time. The Third Examination (Part I.) includes Pathology, Materia Medica, Pharmacology, and Therapeutics. Part II. (Third Examination), taken at the end of the Fourth Winter Session, includes Hygiene and Medical Jurisprudence.

The Final Examination in Medicine, Midwifery, Surgery, and Ophthalmology includes both the theoretical and the clinical branches. No student can enter for the M.B., B.Ch., or B.A.O. until the end of the fifth year after registration, when the curriculum has been completed. The degree of M.D. may be obtained either by examination or on published work.

A Post-graduate Summer Course is held each year, beginning about the middle of June. The D.P.H. Course extends over the year, beginning at the opening of the session.

University College, Cork.

In the School of Medicine students must have passed the Matriculation Examination of the University or some other recognised examination, and a preliminary examination recognised by the General Medical Council.

* No returns.

Medical Students who have passed the First Professional Examination of the Conjoint Boards of Ireland, England, or Scotland may be admitted to the rank of second-year students on making application to the Council. Similarly, students who have passed the Second Professional Examination of the same Boards may be admitted to the rank of third-year students; and those who have passed the Third Professional Examination of the Dublin Colleges, or of the Edinburgh Colleges and Glasgow Faculties, may rank as fourth-year.

The school is provided with physiological, toxicological, pathological, and pharmaceutical laboratories, materia medica, anatomical and pathological museums, as well as a collection of surgical and obstetrical instruments and appliances. There are dissecting-rooms, well-appointed physical, chemical, and biological laboratories, a large natural history museum in the adjoining building, and part of the College ground is laid out as a botanical garden. The plant houses are well filled with plants and are open to the students in the class of Botany. The Library contains about 70,000 volumes and is open daily during term time to students. The Medical Museum occupies a large room erected at the northern end of the medical buildings. There are Students' Clubs for men and women students of the College and various athletic clubs.

Residence of Students.—Students not living at home, or with relatives or friends, sanctioned by their parents or guardians, are required to live in a hostel or in recognised lodgings, and register their addresses each session. The Honan Hostel, adjoining the College, is equipped by private endowment. A number of sets of rooms, together with recreation and common rooms, are provided for lay students who may desire to live there. For full particulars apply to the Warden. The Ursuline Convent, Blackrock, has a house of residence, quite separate from their Secondary School, for Catholic women students.

Clinical Instruction.—Students may attend the South Charitable Infirmary and County of Cork General Hospital, Cork North Charitable Infirmary and City of Cork General Hospital, the Mercy Hospital, the Cork District Lunatic Asylum, the Victoria Hospital for Diseases of Women and Children, the County Lying-in Hospital, Bon Secours, Fever, the District, and Ear, Eye, and Throat Hospitals.

Complete information with regard to class fees, scholarships, and prizes can be obtained from the Dean of the Medical Faculty, and in respect of the hospitals from the Secretaries.

University College, Galway.

The College contains a well-lighted and ventilated dissecting room and an anatomical lecture theatre; physiological, pathological, pharmaceutical, chemical, and physical laboratories; anatomical, pathological, gynæcological, and materia medica museums; as well as large natural history and geological museums and an extensive library in which students can read and from which they can borrow books. In the School of Medicine there are 12 Entrance Scholarships, varying in value from £30 to £60 each, for which Medical Students compete with other students on the Entrance Course. In the Second, Third, and Fourth years three Scholarships in each year, value from £30 to £40 each, are reserved for Medical Students. H. H. Stewart Scholarships (£10 a year for three years) are awarded by the University in Anatomy and Physiology at Second Medical Examination amongst Students of the three constituent Colleges. Travelling Studentships (£200 a year for two years) are offered by the University for competition amongst Medical Graduates of the three Colleges of not more than two years' standing. Women students are eligible for all College and University Degrees, Distinctions, and Prizes. There are extensive grounds, a portion of which is occupied by a Botanic Garden and a portion is at the disposal of the College Athletic Union. There are several student societies in the College, including a Biological Society. There are adundant facilities for research and Post-graduate work in the Chemistry, Physiology, and Pathology departments. There are ample facilities for Women Students. Further information can be obtained from the Registrar of the College.

Clinical Instruction is given in the Galway Tuberculosis Hospital and in the Galway Central and Fever Hospitals, containing on an average 350 patients.

Central Hospital, Galway.

In this completely renovated hospital (300 beds), in addition to the Finer Surgical and Medical Departments, there are now Eye and Ear, Throat and Nose, Gynæcological and Obstetrical, Pathological, X Ray, Ultra-Violet Rays, and Electrical and Massage Departments. Students attend from University College, Galway. Medical and Surgical Clinics are held on alternate days during term. One Resident Physician and one Resident Surgeon are appointed every six months. Resident Students are admitted. The hospital is open to qualified medical men for post-graduate work.

QUEEN'S UNIVERSITY OF BELFAST.

There are six degrees in the Faculty of Medicine of the University—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (B.Ch.), Bachelor of Obstetrics (B.A.O.), Doctor of Medicine (M.D.), Master of Surgery (M.Ch.), and Master of Obstetrics (M.A.O.) The University also grants a Diploma in Public Health and a Diploma in Psychological Medicine, particulars of which will be found in the University Calendar. The degrees of M.B., B.Ch., and B.A.O. are the primary degrees in the Faculty of Medicine, and are conferred at the same time and after the same course of study. No student is admitted to the final examination for these degrees until he has shown: (1) that he is a matriculated student of the University; (2) that he has completed the prescribed course of study in the Faculty of Medicine extending over a period of not less than five academic years from the date of his registration as a student of Medicine; (3) that he has passed the several examinations prescribed; (4) that he has attended in the University during three academic years at least the courses of study prescribed for such degrees (the Senate may accept, for not more than two academic years of the required five, courses of study pursued in any other University or School of Medicine approved by the Senate); and (5) that he has attained the age of 21 years. Every candidate for admission shall matriculate or fulfil such other test of fitness as may be prescribed by the Senate, or may be exempted from the matriculation examination by having passed similar examinations elsewhere. For information as to Scholarships and Prizes, inquiry should be made of the Secretary of the University.

Primary Degrees of M.B., B.Ch., B.A.O.—All candidates for these degrees must satisfy the examiners in the subjects of four examinations.

The First Medical Examination.—The subjects of this examination are Chemistry (Inorganic and Organic), Experimental Physics, Botany and Zoology. The examination will be divided into two parts which may be taken separately: I., Chemistry and Physics; II., Botany and Zoology.

The Second Medical Examination.—The subjects are Anatomy and Practical Anatomy, Physiology and Practical Physiology. Candidates who have previously passed the First Medical Examination may present themselves for this examination at the close of their second year.

The Third Medical Examination.—The subjects are: (1) Pathology and Practical Pathology; (2) Materia Medica, Pharmacology and Therapeutics; (3) Medical Jurisprudence; (4) Hygiene. Candidates who have previously passed the Second Medical

Examination may present themselves for Part I. of this examination at the close of the third year, and for Part II. at the end of the Winter Session of the fourth year. Attendance on a course in any subject of the Third Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the Second Medical Examination.

The Fourth Medical Examination.—The subjects are: (1) Medicine; (2) Surgery; (3) Midwifery; (4) Ophthalmology and Otology. This examination may be taken in two parts: I., Systematic; II., Clinical, Practical and Oral. Candidates who have previously passed the Third Examination may present themselves for Part I. of the Fourth Examination at the close of the fourth year, provided that they have fulfilled the necessary requirements as to attendance, &c., on the courses of instruction in the subjects of examination. Candidates who have passed Part I. of this examination may present themselves for Part II. at the close of the fifth year, provided that they have fulfilled the necessary requirements as to hospital attendance on the various clinical courses in the subjects of examination. Parts I. and II. may be taken together at the close of the fifth year. Attendance on a course in any subject of the Fourth Medical Examination shall not entitle a student to a certificate of attendance unless he has passed in the subjects of the Second Medical Examination.

Degrees of M.D., M.Ch., and M.A.O.—These degrees are not conferred until the expiration of at least three academic years, or in the case of graduates of the University in Arts or Science of at least two academic years, after admission to the primary degrees in the Faculty of Medicine. Every candidate must show that in the interval he has pursued such courses of study, or been engaged in such practical work as may be prescribed. These degrees may be conferred by the Senate either (*a*) after an examination, which includes written, oral, clinical, and practical examinations; or (*b*) on the submission of a thesis or other evidence of original study or research, to be approved by the Faculty of Medicine after an oral or other examination of the candidate on the subject.

The Medical School.—The Donald Currie Chemical Buildings contain a lecture theatre, a preparation room, a chemical museum, a large class-room for elementary practical chemistry, laboratories for qualitative and quantitative analysis, rooms for water and gas analysis, dark room for photographic purposes and balance room, provided with all modern appliances. The Anatomical Department contains a large and well-lighted dissecting-room, a lecture-room, a professor's and demonstrator's room, a bone-room, and a laboratory for microscopic and photographic work. The Medical Museum is in the same building. The Jaffé Laboratories for Physiology comprise a lecture theatre, laboratories for practical work in chemical physiology, histology, and experimental physiology, and in addition small private research rooms, including balance, galvanometer, and centrifuge rooms. The J. C. White laboratories, recently founded, are fully equipped for research in biochemistry and bacteriology. The Musgrave Pathological Laboratory.—In this department opportunity is afforded for research in pathology and bacteriology. The department is in touch with most of the hospitals in Belfast, and there is an ample supply of material for investigation by graduates in morbid histology, clinical pathology, and the bacteriology of infectious diseases. A course in pathology or bacteriology is given to graduates, and members of this class have an opportunity of seeing the methods employed in the various investigations carried out in the department for the Public Health Committee of the Corporation in connexion with water-supply, sewage disposal, meat- and milk-supply, and the diagnosis of cases of infectious diseases. The certificate issued to members of the class in bacteriology qualifies for the D.P.H. degree. The Pharmaceutical Laboratory is fitted and equipped for the work of practically instructing students in t compounding and dispensing of medicines.

Clinical Instruction.—The following institutions a recognised by the University as affording prop opportunities for clinical instruction: the Roy Victoria Hospital, the Mater Infirmorum Hospit the Union Hospitals, the Belfast Hospital for Si Children, the Belfast Maternity, the Ulster Hospit for Women and Children, the Ulster Eye, Ear, a Throat Hospital, the Belfast Ophthalmic Hospit the Purdysburn Fever Hospital, and the Belfa District Lunatic Asylum. Complete information ca be obtained from the respective Secretaries.

Royal Victoria Hospital, Belfast.

There are 436 beds. Students eligible for McGrat McQuitty, Malcolm, Coulter Smyth and Elwoo Scholarships aggregate annual value £185. Twel House Surgeons and House Physicians. Thirty-s resident pupilships, three months each, annuall for Senior Students, of which a proportion is allotted t Women Students, Special Departments for Radiolog Clinical Pathology, V.D., Dermatology, Gynæcolog Vaccine Therapy, Electrocardiography, Dentistr Radium Therapy.

Mater Infirmorum Hospital, Belfast.

This hospital contains 270 beds and is open at a hours for the reception of accidents and urgent case Clinical instruction is given daily by Physicians a Surgeons. Surgical operations are performed daily The out-patient departments in Medicine and Surger also the special dispensaries for Gynæcology, Ear, Ey and Throat, Electrotherapeutics, Venereal Disease are very largely attended and afford valuabl opportunities to students for the study of thos subjects. A House Physician and two House Surgeon are elected every six months. Resident pupils a admitted as the vacancies arise. Three Exhibition and a Gold Medal are competed for annually in Jun Certificates of attendance upon this hospital a recognised by all the Universities and licensing bodie in the United Kingdom.

Belfast Infirmary and Hospital.

There are 1700 beds. Clinical courses are give quarterly, and a course for D.P.H. in Hospita Intern Venereal Clinic in Infirmary under Corporatio scheme. Maternity Hospital recognised for Practica Midwifery training. Particulars may be obtained o application to the Hon. Sec. Visiting Medical Staf Certificate of vaccination class recognised by Loca Government Board. There is a department fo Cancer with 32 beds, and X Ray and Bacteriologica Departments.

Belfast Hospital for Sick Children.

At the hospital in Queen-street there are 45 beds Clinical instruction is given. During the Winte and Summer Sessions Courses of Lectures are delivere on the Medical and Surgical Diseases incidental t Infancy and Childhood. Demonstrations in Ophthal mology and Pathology are given, and ampl opportunities are afforded in the wards and in th Out-patient Department for gaining a practica and theoretical knowledge of the diseases of Infanc and Childhood. This Hospital grants Certificate in Diseases of Children, which are recognised by th various Examining Bodies. Certificates are als granted for post-graduate study. A Gold Medal i offered for competition at the close of the session.

Maternity Hospital, Belfast.

At this institution in Townsend-street there are 2 beds in constant occupation, and exclusively devote to Midwifery and Antenatal conditions. There is also a large district. The Queen's University of Belfas have erected a Students' Hostel in connexion wit the Hospital where six Students and Post-graduate are received each month. The University Tutor i Obstetrics resides in the Hostel and Student conduct their cases under his supervision. There

is a large Antenatal Department and a Department for Venereal Diseases. Communications should be made to the Hon. Secretary of the Medical Staff.

Ulster Hospital for Children and Women.

At this hospital in Templemore-avenue, Belfast (60 beds), clinical instruction is given to students in Diseases of Children, Gynæcology and Obstetrics. Special departments: Radiology and Actinotherapy, Eye, Ear, and Throat, V.D. Clinic and Antenatal Clinic. Gold Medal awarded annually. Two House Surgeons appointed from students of hospital.

Benn Ulster and Belfast Ophthalmic Hospitals.

At the Benn Ulster Eye, Ear and Throat Hospital, Clifton-street (30 beds), and Belfast Ophthalmic Hospital, Great Victoria-street (30 beds), practical demonstrations by the staff and occasional clinical lectures in the subjects of Ophthalmology, Otology, and laryngology are given. Clinical instruction is given daily.

Belfast Fever Hospitals.

City Fever Hospital, Purdysburn (360 beds); Union Fever Hospital (200 beds). Clinical Classes are held during the winter and summer sessions. Post-graduate (D.P.H.) Classes are also held. Dr. A. Gardner Robb, Lecturer and Medical Superintendent.

Belfast Mental Hospital.

Purdysburn Villa Colony. (1300 beds.) University Lectures and Clinics.

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

CONJOINT EXAMINING BOARD.

The Conjoint Board of the Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland requires of candidates the passage either of its own preliminary examination in the subjects of general education or proof that the candidate has passed one of the tests accepted by the General Medical Council as well as passing in the Pre-Registration Examinations in Chemistry and Physics and Biology.

Professional Examinations.—There are three professional examinations, the first of which cannot be passed earlier than the end of the second winter session, nor the final before the conclusion of full five years of medical study. Before being admitted to any of them the candidate must show that he has studied the different subjects in practice and theory for the requisite periods, certificates to this effect being accepted from the authorities of most of the recognised medical schools at home and abroad. The first examination deals with (*a*) Anatomy, and (*b*) Chemical Physiology and Histology. The second examination deals with (*a*) Pathology, (*b*) Materia Medica, Pharmacy, and Therapeutics and Ophthalmology, and may be taken separately.

Final Examination.—This is divided into three divisions, which cannot be completed until at least five years have passed in medical studies other than those for the Pre-Registration Examinations, and five years at least since the beginning of the curriculum. The divisions are (*a*) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (*b*) Surgery, including Operative Surgery; (*c*) Midwifery, including Diseases of Women and Children, and the Practice of Vaccination.

Diploma in Psychological Medicine.—There are two examinations in connexion with this Diploma: Part I. consists of (*a*) Anatomy and Physiology of the Nervous System; (*b*) Psychology. Part II.: (*a*) Neurology, including Clinical and Pathological Neurology; (*b*) Psychological Medicine, including its legal relationships.

Further information can be obtained from the Secretary of the Committee of Management, Royal College of Surgeons, St. Stephen's Green.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The College issues its Licences in Medicine and in Midwifery to practitioners whose names appear on the Medical Register of the United Kingdom.

The Licence in Medicine.—The subjects of examination are: Practice of Medicine, Clinical Medicine, Pathology, Medical Jurisprudence, Midwifery, Hygiene, and Therapeutics.

The Licence in Midwifery.—Candidates must produce certificates of registration. A registered medical practitioner of five years' standing may be exempted from the examination by printed questions.

The Membership.—Examinations for Membership are held in February, June, and November.

The Fellowship.—Fellows are elected by ballot. Applicants must have been a Member of the College for at least one year and must have attained the age of 27 years.

Further particulars can be obtained from the Registrar of the Royal College of Physicians of Ireland, 6, Kildare-street, Dublin.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

The College issues its Licence in Surgery to practitioners whose names are entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he presents himself for examination, and who satisfies the Council that he has passed through a course of study and Examinations equivalent to those required by the Regulations of the Irish Conjoint Board.

Candidates are examined in General Surgery (paper and oral), Clinical Surgery, Surgical Pathology (oral), Operative Surgery, Surgical Anatomy (paper), and Ophthalmic and Aural Surgery (clinical).

Diploma in Midwifery.—A diploma in Midwifery is granted after examination to persons possessing a registrable qualification.

Fellowship Examinations.—Candidates for the Fellowship shall make application to the President and Council to be admitted to examination. They are required to pass two examinations—Primary and Final. Candidates may present themselves for the Final Examination immediately after passing the Primary part, provided they have complied with the necessary regulations. The subjects for the Primary Examination are (*a*) Anatomy, including Dissections; and (*b*) Physiology and Histology. The subjects for the Final Examination are Surgery, including Surgical Anatomy and Pathology For admission to the Final Examination the candidate must have passed the Primary Examination, and must be a Licentiate or Graduate in Surgery of a university or licensing body recognised by the General Medical Council; all such candidates must not be less than 25 years of age.

Further particulars can be obtained from the Registrar of the College, Stephen's-green West, Dublin.

Schools of Surgery.

The Schools of Surgery are attached by Charter to the Royal College of Surgeons and have existed as a department of the College for over a century. They are carried on within the College buildings and are specially subject to the supervision and control of the Council, who are empowered to appoint

and remove the professors and to regulate the methods of teaching pursued. The buildings have been reconstructed, the capacity of the dissecting-room nearly trebled, and special pathological, bacteriological, public health, and pharmaceutical laboratories fitted with the most approved appliances in order that students may have the advantage of the most modern methods of instruction. The entire building is heated by hot-water pipes and lighted throughout by the electric light. Winter Session commences in October; Summer Session in April. Scholarships and Prizes: Carmichael Scholarship, £15; Mayne Scholarship, £8; Stoney Memorial gold medal; Operative Surgery, gold and silver medals; Pierefoy Memorial Prize, value £150; Barker Prize, £26 5*s*.; H. Macnaughton-Jones gold medal in Obstetrics and Gynæcology; and class prizes and medals. Prospectuses and guide for medical students can be obtained post free on written application to the Registrar, Royal College of Surgeons, Stephen's-green W., Dublin.

APOTHECARIES' HALL OF IRELAND.

The Licence of this Hall is granted to students who present certificates of having fully completed the course of study as laid down in the curriculum and who pass the necessary examinations. The diploma of the Hall entitles the holder to be registered as a practitioner in medicine, surgery, and midwifery, with also the privileges of the Apothecary's Licence.

Candidates must pass two Professional Examinations, called the Primary Examination and the Final Examination, which are conducted at separate times, partly in writing, and partly practically and orally. The Primary and Final Professional Examinations are held twice a year—viz., in June and January, or such other dates as may be determined.

Candidates who produce satisfactory evidence of having passed an examination for a Degree or Licence in Medicine, conducted by any University or Royal College in the British Empire, or by any Foreign University whose Degrees are recognised in the Foreign List of the Medical Register, will be exempted from the Primary Examination.

The subjects for Part I. of the Primary Examination are: Anatomy, Physiology and Histology, including Bio-Chemistry; and for Part II., Materia Medica and Pharmacy, Pathology, and Medical Jurisprudence and Hygiene.

For the Final Examination the subjects are: (*a*) Medicine and Clinical Medicine and Clinical Methods. (*b*) Surgery—Clinical, Ophthalmic and Operative; and Surgical Anatomy. (*c*) Midwifery and Gynæcology, and Practical Pharmacy and Materia Medica (if not taken at Intermediate Examination).

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21 years. The details of the course of education required and syllabus of the examinations will be supplied by the Registrar at 95, Merrion-square, Dublin.

PHARMACEUTICAL SOCIETY.

THE SCHOOL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN is recognised by the University of London. The Society conducts examinations for registration as (*a*) Chemist and Druggist and (*b*) Pharmaceutical Chemist. Courses of Instruction are given for these examinations, in the latter case in conjunction with University College.

An Intercollegiate two years' course for the Final Examination for the degree of B.Pharm. of the University of London is also given in conjunction with University College. Medical students are admitted to the lectures and laboratory work in any or all the courses. Certificates of instruction in the School are received by the Conjoint Board of the Royal Colleges and by the University of London. Graduates of approved Universities may carry out the research work necessary for the thesis for the Ph.D. of the University of London in the Society's Research Laboratories; this degree may now be taken in Pharmacognosy or Pharmacy in the Faculty of Medicine. Several scholarships are also offered. Further information may be obtained from the Dean, Prof. Greenish, 17, Bloomsbury-square, London.

PRISON MEDICAL SERVICE.

CANDIDATES for the Prison Medical Service are approved by the Secretary of State for the Home Department on the recommendation of the Prison Commissioners. Preference is always given to candidates who have experience of lunacy. Application for employment may be made on a special form which can be obtained from the Secretary, Prison Commission, Home Office, London, S.W. In the smaller prisons the medical officership is part-time and is usually filled by practitioners in the locality, preference being given to those who have special experience of lunacy. In the large prisons the medical staff must devote their whole time to the Service. In the case of whole-time service, the appointment is in the first instance to the post of Medical Officer, Class II., and from this rank the Medical Officers, Class I., are selected as vacancies occur. The pay of the whole-time prison medical staff is as follows: Medical Officer, Class II., £350, rising by annual increments of £20 to £600, making the pay at present with bonus £485 8*s*. to £776 7*s*.; Medical Officer, Class I., £650, rising by annual increments of £25 to £800, plus bonus, making the pay £837 5*s*. to £995 11*s*. Unfurnished quarters are provided or an allowance in lieu is made. Study-leave is granted annually to two of the whole-time Medical Officers. There are 12 full-time medical officers of Class I. and 1 Class II., and 23 part-time medical officers. The number of vacancies is never large and promotion is slow.

GUILD OF ST. LUKE.

THE Guild of St. Luke was founded over 60 years ago by a few medical students, chiefly to meet their own religious needs. It now makes a wider appeal and its membership is open to all students and practitioners of medicine, both men and women, who are members of the Church of England, the clergy of which are eligible as Clerical Associates. The Chapter meets in every month of each term, and a festival service is held yearly at St. Luke's tide, usually at St. Paul's or Westminster Abbey. This year the service will be at the Abbey. Besides the parent Guild, there are a Women's Ward and a Hospital Student's Branch in London. There are also a Midland Counties Ward and a Cambridge Ward. Particulars of the objects and activities of the Guild and forms of application for membership can be obtained from the Secretary of the Guild of St. Luke, King's College, Strand, W.C.2.

WE take this opportunity of thanking the officials of Government Departments and the Deans and Secretaries of the various institutions for their kind coöperation in enabling us to bring the information contained in our Students' Number up to date.

VOLUNTARY STERILISATION OF BLIND WORKERS.—Speaking at the Modern Churchmen's Conference last week Mr. C. J. Bond, F.R.C.S., said his advice had recently been sought by a Statutory Committee charged with the supervision of the blind in their area. This Committee wishing to discountenance the marriage of blind workers under their care, had passed a rule providing that those who married without their consent would cease to receive benefit and employment by the Committee unless one or both parties to the marriage could produce a medical certificate that the marriage would be childless. Two blind young couples under the care of this Committee had, he said, expressed in writing their willingness to undergo sterilisation and so comply with the Committee's rule. If a Statutory Committee with the care of blind persons in their area were justified in such an action, surely, said Mr. Bond, the State is justified in requiring that persons who are liable to transmit serious mental or bodily defect should also undergo sterilisation.

THE LANCET.

LONDON: SATURDAY, AUGUST 30, 1930.

CONTINUITY IN MEDICAL TEACHING.

ONE thing that all authorities, alike in this country or abroad, are now agreed upon in respect of medical education is that the principle of continuity should prevail, so that the general scientific foundation laid in the pre-clinical period should be relied upon by students throughout their educational course. There was no manifest need 50 years ago to lay any stress upon so obvious a truth, for in those simpler days the medical students received their instruction from teachers who were themselves exemplars of continuity in its most practical sense. At least until the early eighties the teachers in the medical schools began their educational work by instructing the students in the preliminary subjects, and as the students passed in their period of probation from physics, chemistry, and biology, to anatomy and physiology, and thence to the strictly professional subjects, so their teachers went up the ladder, becoming demonstrators of anatomy and physiology; thus making good their claim for promotion to the medical staff. But already, 50 years ago, our knowledge of those preliminary subjects had developed to such an extent that it was impossible for the same man to keep track of advancing wisdom along general scientific lines and at the same time concentrate upon his real business in life, the prevention and relief of disease. And, be it noted, that concentration was more than ever required as the growth of the fundamental sciences opened up new vistas for therapeutics. Soon it was perceived that two acute questions arose for the consideration of all authorities concerned in the education of medical students. These questions were first, what should be the range of accomplishment required in the preliminary subjects, and, secondly, how should a continuity of instruction be maintained? Should the teachers of the preliminary subjects persevere in their instructions throughout the later course of the students' training, or should the clinical teachers be relied upon to recall to their students' attention the intimate and vital connexions between the fundamental sciences and professional equipment?

For the last two years these questions have demanded incessant consideration from the General Medical Council as the supreme authority upon medical education in the country, and recently a questionaire has been submitted to the qualifying bodies in the kingdom, the interrogatory taking a form which should elicit answers to the questions. The replies of the qualifying bodies, which in the first instance required supplementing, have now been published as an appendix to the report to the Council of its Education Committee. From these replies it is clear that the difficult position has always been apparent to the teachers in the medical schools, and that much forethought along different directions has been exercised to provide the desired continuity in the training of the students. That a common pattern of training has not resulted is a matter for no regret, since obviously, while still subject to the controlling hand of the General Medical Council, the various universities and affiliated schools must work along lines which experience dictates as most suited to the particular centres. But a general inclination emerges from the replies to the questionaire, taken as a whole, that reliance should be placed upon the willingness and the ability of the clinical teachers to introduce as far as possible in their teaching arguments derived from, and lessons clearly dependent upon, familiarity with the preliminary sciences. This collective opinion is based upon the view that the time of the medical student is now so occupied, or over occupied, with formal and necessary instruction in the clinical subjects, and with the acquisition of experience at the bedside, that the interpolation in courses of such intensity of formal instruction upon the preliminary subjects would give no fruitful results.

The Education Committee find it premature, upon the information received from the various schools, to come to any dogmatic decision as to the relative advantages of the several methods of obtaining the correlation of the pre-clinical with the clinical subjects. They point out that the value of the different schemes of teaching which now come under review may be appraised by the extent to which the questions actually set in the final examinations accord with the training. This is to relegate the solution of the difficulty to the future. Teachers and students alike will value any arrangements which fit the courses of instruction to the tests of examination, but as medicine becomes more integrally associated with general science, so will it become more necessary to face the real problem, which is to define the demands to be made upon those who are seeking qualification, while providing adequate training upon special lines through post-graduate instruction. When agreement prevails as to how far instruction in certain of the special subjects can be postponed, to be obtained after qualification in accordance with the individual bents of the newly qualified, then it should be possible to lighten the students' curriculum in making room for revision courses in general science to accompany clinical teaching. On all grounds there should be no delay in the organisation of post-graduate instruction in this country, as once again we are reminded by Dr. HARVEY SMITH'S informative Presidential Address at Winnipeg.

THE MEDICAL SERVICES

ROYAL NAVAL MEDICAL SERVICE.

THERE always have been, there are now, and there always will be a certain number of young medical men to whom life in the Royal Navy appeals more than does any other life of a medical man. The type referred to is the man who may have been brought up in Naval surroundings, he may have Naval relations, or he may just love the sea. To a man of this temperament a career as a Medical Officer in the Royal Navy offers very definite attractions. In these days his professional knowledge will most certainly not rust anywhere; but especially in the Naval Hospitals will he have opportunities of practising every branch of his profession, except, of course, diseases of women. He can obtain one of the 60 paid specialist appointments. These include medicine, surgery, diseases of the eyes, diseases of nose, ear and throat, radiology, anæthetics, genito-urinary and venereal diseases, physical training, bacteriology, pathology, and hygiene. He will be encouraged to work hard and play hard. He will see the world under ideal conditions, because wherever he goes he will be a welcome guest, as is always the case with those who are privileged to wear the King's uniform.

In any walk in life success and happiness depend primarily on two main conditions. You must like your fellow men and they must like you.

The right type of man for a Naval Medical Officer is a good doctor, keen on his work and keen on his play, unselfish and a gentleman.

If the doctor is of this type he is invariably everybody's friend. The Naval Officer and the blue-jacket are quick to recognise a Medical Officer who is keen on his work, thoughtful of his patients, and one who strives after improving the health of the Navy. Such a Medical Officer finds life agreeable as everyone is ready to befriend him, and nowhere can one find more delightful friends than in the Navy.

Officers who have held appointments as Medical or Surgical Officers in Civil Hospitals for any period prior to entry, after qualifying, are eligible under the regulations to have their seniorities ante-dated by not more than one year.

To help men to take higher qualifications opportunities are given, when the exigencies of the Service will permit, for medical officers to take post-graduate courses prior to sitting for these higher examinations. A large number of Naval Medical Officers since joining the Navy have taken qualifications such as M.D., F.R.C.S., M.R.C.P., D.P.H., D.T.M., D.O.M.S., &c. It is recognised that this is good for the Navy and good for the officer himself.

WORK OF THE NAVAL MEDICAL SERVICE.

In our large Naval Hospitals the medical, surgical, and specialist work is of a very high standard. The work is very exacting, and it is the aim of the Admiralty to arrange appointments as far as possible so that medical officers have an opportunity of alternating their work, not only at home and abroad, but also ashore and afloat.

To give Naval Surgeons opportunities for professional work has always been a very definite policy of the Admiralty, and within the last year or so this matter has received still further attention.

The General and Specialist Courses have been increased so that, as far as possible, every officer shall have a course of instruction of not less than four months' duration every four years. The number of specialists allowed is now 60 and the specialist allowance is 5*s.* a day.

The total number of Medical Officers in the Navy is about 400, including 1 surgeon Vice-Admiral (Medical Director-General), 6 Surgeon Rear-Admirals, and 20 Surgeon-Captains, and every improvement has been made towards giving increased opportunitie of advancement and accelerated promotion to th best men.

The advantages of a career with its period c strenuous clinical work, followed by a period of com parative leisure which can be devoted to study, &c are laid stress on in the Presidential Address of th War Section of the Royal Society of Medicine delivere on Oct. 10th, 1927.

The work and professional opportunities of th Service Medical Officer are described, but the addres is necessarily brief, and it is only by reading betwee the lines that one can really visualise the field fo work which lies before the keen Naval Doctor.

Not only has he this purely medical work to intere him. He has opportunities to emulate some of th great Naval Surgeons of the past, such as Darwi Huxley, and many others, who have contributed s much to science.

MEDALS AND PRIZES.

Gilbert Blane Medal.—This Medal is awarde annually to the Surgeon Lieutenant Commander wh obtains the highest aggregate marks at the examin tion for promotion to the rank of Surgeon Commande The award is subject to the approval of the Presiden of the Royal College of Physicians and Surgeon respectively and the Medical Director-General the Navy.

Other awards and prizes open to Naval Medic Officers are the Chadwick Naval Prize, the Nort Persian Forces Memorial Medal, and the Park Memorial Prize.

PLAY IN THE NAVY.

Recreation is a vital part of the Navy, and there no branch of athletics or field sports in which the Nav Officer does not have an opportunity of trying h hand. Not only is the champion encouraged b also the less proficient.

In every home port and on most foreign statio there are opportunities for football, cricket, tenn golf, rowing, sailing, swimming, and all other spor On some foreign stations the Naval Officer can g shooting and riding in plenty, and so cheap that can indulge in them on his pay alone. In civil life home only a rich man could get such magnifice shooting as the Naval Officer does is some parts of t world.

PAY AND ALLOWANCES.

Full Pay.

		£	£	
SURGEON LIEUTENANT (short service and permanent service)	from	450 to	493	per annu
SURGEON LIEUTENANT - COMMANDER (promoted after six years' service)	,,	593 to	627	,,
SURGEON COMMANDER (promoted after a further six years' service)	,,	763 to	967	,,
SURGEON CAPTAIN (promoted by selection)	,,	1104 to	1367	,,
SURGEON REAR-ADMIRAL (promoted by selection)		1782		
MEDICAL DIRECTOR-GENERAL (Surgeon Vice-Admiral)		2325		

Allowances.

An outfit allowance of £50 towards cost of uniform is given

Allowances when in charge of hospitals and sick-quarters	10*s.* and 5*s.* per diem.
Sixty Specialist allowances of	5*s.* per diem.
Allowances to Senior Medical Officers in flag ships	5*s.* and 2*s.* 6*d.* per diem.

Accelerated promotion can be gained under certain condition provision allowance and lodging allowance are paid wh victualling and accommodation are not provided. Servan allowance is also payable in certain appointments.

The extra allowances alluded to in this table are not to looked upon as very exceptional. About a quarter of t Medical Officers of the Navy are drawing extra allowances.

The cost of living in the Navy is cheap, and officer can live on his pay and enjoy life if he is r extravagant, especially if he does not embark

matrimony too early. A small amount of private means goes much further in the Navy than in civil life. The three vital points—pay, prospects, and promotion—of the naval medical officer can be grasped by referring to the above clear and brief table.

PENSION.

Naval Officers retire at certain ages according to the rank they have attained. Except for those promoted to the 27 higher posts, the usual retiring age is 50 as Surgeon Commander, the appropriate pension according to scale being £558 per annum.

With his experience in the Service, together with specialist qualifications, the Naval Medical Officer is able to obtain excellent openings on shore, being still at the age of 50 able to hold his own with his civilian confrères and being professionally at his best.

The scale of pensions is as follows :—

	Maximum retired pay.
SURGEON VICE-ADMIRAL ..	£1112 per annum, on vacating office.
SURGEON REAR-ADMIRAL ..	£940 per annum, at age of 60.
SURGEON CAPTAIN	£837 „ „ 55.
SURGEON COMMANDER	£558 „ „ 50.
SURGEON LIEUTENANT-COMMANDER AND SURGEON LIEUTENANT	£419 „ „ 45.

Officers permitted to withdraw receive gratuities on the following scale :—

	£
After 4 years' full pay permanent service ..	500
„ 8 „ „ „ „ ..	1000
„ 12 „ „ „ „ ..	1500
„ 16 „ „ „ „ ..	2250

Of recent years Medical Officers have been admitted into the Navy without entrance examination, and for short service, with the option of turning over to the permanent service, but it is anticipated that it will not be long before the Admiralty will revert to the old established system of entrance by competitive examination twice a year, in batches of about ten officers.

The Medical Director-General of the Navy, Queen Anne's Chambers, Tothill-street, London, S.W.1, would be glad to receive inquiries from prospective candidates.

Dental Branch.

The Naval Dental Service offers similar opportunities to qualified dental surgeons except that higher rank than that of the recently instituted Surgeon Captain (D) is not open to them. They are provided with suitable surgery accommodation equipped with modern appliances and supplied with all material required for their work, and there is every opportunity for them to maintain a high standard of professional skill.

Candidates are required to produce certificates of birth, registration, and of character, and must be physically fit for active service anywhere. An outfit allowance of £50 is payable to officers finally entered and commissioned. The rank of Surgeon Lieutenant-Commander (D) is attained on the completion of six years' satisfactory service. Promotions to Surgeon Commander (D) and Surgeon Captain (D) are made strictly by selection from the rank next below and are confined to officers who prove fitted in every respect for these ranks. The present establishment of dental officers is : 1 Surgeon Captain (D), 3 Surgeon Commanders (D), 60 Surgeon Lieutenant-Commanders (D) and Surgeon Lieutenants (D).

Provision has been made for candidates who have held, or who, at the time of passing the examination held or are about to hold, an appointment as Dental Officer in a recognised Civil Hospital. The time concerned, provided it does not exceed six months, may reckon for increase of full pay while on the active list.

On the completion of two years' service in the rank of Surgeon Lieutenant-Commander (D), dental officers on the Active List are eligible for a three months' post-graduate course at a dental hospital and school at the public expense, and will draw full pay while attending the course.

Pay.—The current rates of full pay for Dental Officers are as follows :—

	£ £
Surgeon Lieutenant (D)	374–459
Surgeon Lieutenant-Commander (D) (promoted after six years' service)	551–678
Surgeon Commander (D) (promoted by selection to fill vacancies in Establishment)	721–924
Surgeon Captain (D) (promoted by selection to fill vacancy in Establishment).. ..	1062–1314

The Regulations regarding Pension and Withdrawal Gratuities are the same as for Medical Officers in the corresponding Ranks.

In 1919, when new rates of pay for all Naval Officers were fixed, it was decided that 20 per cent. of these rates should be considered as due to the then high cost of living. The rates of pay shown above are those payable on and after July 1st, 1930, and represent a reduction of approximately 7 per cent. owing to the decrease in the cost of living. The 20 per cent. above mentioned is to be regarded as variable and subject to change on July 1st, 1931, and thereafter as may be decided, either upwards or downwards according as the cost of living rises or falls.

ARMY MEDICAL SERVICE.

Royal Army Medical Corps.

SINCE the publication of the Royal Warrant of 1926 further improvements have been made in the conditions of service in the Royal Army Medical Corps, and this service can be recommended as a career to young medical men.

In addition to the grant of permanent commissions, the War Office offer a number of temporary commissions in the Royal Army Medical Corps, the holders of which may be invited at the end of 12 months' service, if suitable, and provided that vacancies exist, to accept permanent commissions in the Royal Army Medical Corps. If a permanent commission is accepted, the temporary service is allowed to count as the equivalent of permanent service for promotion, increase of pay, and retired pay. These conditions enable the young medical man to make acquaintance with army life, without detriment to his ultimate prospects, before deciding whether to make a permanent career in the Royal Army Medical Corps.

The regulations for admission giving full details should be obtained from the Permanent Under Secretary of State (A.M.D. 1), War Office, Whitehall, London, S.W. 1, and carefully studied. A personal interview with a representative of the Director-General, Army Medical Services, is readily obtainable.

The rates of pay and allowances are good; the opportunities of post-graduate study are generous, and the work is varied, responsible, and interesting. The gratuities after certain periods of service enable an officer should he so desire to leave the Service with a capital sum large enough to go a long way towards re-establishing himself in civil life, and, further, the knowledge of the world and the comradeship of his fellow officers that he has gained in the Army will be of no small value to him.

New entrants are commissioned in the rank of Lieutenant, and the first six months of service are spent on probation, during which time they undergo, in addition to their Military training at the Royal Army Medical Corps Depôt at Aldershot, a probationary course at the Royal Army Medical College in London in Hygiene, Pathology, Tropical Medicine, Military Surgery, Recruiting, the prevention and treatment of Venereal Disease, and the elements of Army Administration. At the end of this course, and after qualifying at the necessary examinations, their commissions are confirmed, and they take their places in seniority according to the total marks obtained at all examinations up to that date. Officers

Training Corps service with possession of Certificates "A" or "B" (Medical) carries a definite value in marks in this total.

An entrant who is holding or about to hold at the time of the entrance examination an approved whole-time Appointment at a recognised Civil Hospital may be seconded while holding such an appointment up to a maximum period of 12 months. A candidate who has held such an appointment within six months of entry may be granted an antedate up to 12 months in respect of the period the appointment was held. This secondment and antedate counts in all respects as commissioned service, except that pay will not be issued for that period. The Army Council are endeavouring to arrange for all officers who have not themselves obtained a civil hospital appointment to be given a house appointment in a civil hospital for six months, shortly after they receive their commissions.

After a total period of one year's service at home the young officer goes abroad, probably to India, for his first tour of foreign service. Here he gains his first practical experience of tropical disease and tropical hygiene, and possibly his first experience of active service on the frontiers of India. His tour abroad lasts five years, with probably six months' leave home during that time. On returning home the R.A.M.C. officer has the opportunity to decide whether he will remain in the Corps or accept the gratuity of £1000 after seven years' service, and try his fortune in civil life. If he elects to remain, he will, between his eighth and twelfth year of service, undergo a course of post-graduate study at the Royal Army Medical College and the London Hospitals of five months' duration, followed by a course of study of a special subject selected by himself, provided he has shown special aptitude in the post-graduate course or during his previous service. During this period of study he remains on full pay, and the fees for the courses are paid by the State. When qualified in his special subject, the officer becomes entitled to specialist pay at 5s. per day when holding a specialist appointment. After this post-graduate course the officer probably proceeds abroad again and promotion to Major rapidly ensues, and from that time onward the officer receives regular successive increases of pay, and is eligible for additional and charge pay as well. The Directorates of Hygiene and Pathology and the appointment of two serving officers as Consultants in Medicine and Surgery have been instituted and have proved a marked success, all these appointments being of the rank of Colonel or Major-General.

Under these conditions the possibilities for good workers are very great in the Royal Army Medical Corps. There is scope for original research in tropical disease, in preventive medicine, and in bacteriology as well as in the large clinical field open to the specialist in Medicine, Surgery or Gynæcology, in Venereal Disease, and in Ophthalmology. Child welfare is also undertaken systematically by officers of the Royal Army Medical Corps.

At the same time instruction in administration is continuous. The Royal Army Medical Corps is essentially organised for war, and one of the lessons of the Great War was that trained administrators must exist to enable the fullest benefit to be obtained from professional talent. Many appointments carrying administrative responsibility are open to those officers who display capacity for this duty. All officers must be prepared to undertake command and to have a knowledge of Army administration, especially in war.

PAY AND ALLOWANCES.

Rank.	Pay per diem.*	Rations.†	Servant.	Married.			Unmarried.		Approximate daily total.		Approximate yearly total.	
				Lodging.	Fuel and light (average)	Furniture allowance.	Lodging.	Fuel and light (average)	Married.	Unmarried.	Married.	Unmarried.
	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.	£ s. d.	£	£
Lieutenant	1 0 6	1 6	2 0	3 6	1 8	2 0	2 6	0 8	1 11 2	1 7 3	569	497
Captain—	1 5 2	1 6	2 0	4 6	2 9	2 0	2 6	0 8	1 17 11	1 11 11	692	585
After 8 years' serv.	1 7 10	1 6	2 0	4 6	2 9	2 0	2 6	0 8	2 0 7	1 14 7	741	633
After 10 years' serv.	1 10 2	1 6	2 0	4 6	2 9	2 0	2 6	0 8	2 2 11	1 16 11	783	674
Major—	1 14 10	1 6	2 0	4 6	2 11	2 0	4 0	1 3	2 7 9	2 3 9	872	794
After 15 years' serv.	1 19 6	1 6	2 0	4 6	2 11	2 0	4 0	1 3	2 12 5	2 8 3	957	881
After 18 years' serv.	2 1 10	1 6	2 0	4 6	2 11	2 0	4 0	1 3	2 14 9	2 10 7	999	923
After 20 years' serv.	2 6 6	1 6	2 0	4 6	2 11	2 0	4 0	1 3	2 19 5	2 15 3	1085	1008
Lieut.-Colonel ..	2 13 6	1 6	2 0	4 6	3 0	2 0	4 6	2 5	3 6 6	3 3 11	1213	1161
After 3 years' serv. as such	2 18 2	1 6	2 0	4 6	3 0	2 0	4 6	2 5	3 11 2	3 8 7	1299	1251
Colonel	3 5 2	1 6	2 0	5 6	3 11	2 0	5 6	2 9	4 0 1	3 16 11	1461	1408
Major-General ..	4 8 4	1 6	4 0	11 0	5 0	2 0	11 0	3 11	5 11 8	5 8 8	2038	1988

serv. = service.

* Pay Warrant rates as amended by A. O. 196/26 less 7 per cent. from July 1st, 1930, vide A.O. 237 of 1929. The Pay Warrant rates are subject to revision to an extent not exceeding 20 per cent. according to variation in the cost of living. The next revision takes place from July 1st, 1931.

† Rates of allowances vary from time to time and issues are subject to conditions laid down in the Allowance Regulations.

Equally important is the technical training of the Non-commissioned Officers and men of the Corps in such "trades" as Trained Nurse, Nursing Orderly, Masseur, Radiographer, Operating Room Assistant, Laboratory Assistant, Hospital Cook, Dispenser, &c. This training is carried out by the Officers and Nursing Sisters, and opens a large field for those who have ability in lecturing and teaching as well as the power of influencing men.

PROMOTION.

Promotion takes place automatically to Captain after 3½ years, and to Major after 12 years' service, provided the officer is qualified and recommended for promotion. Promotion to the higher ranks is by selection from those senior in the rank below, but special promotion by brevet or otherwise is open to officers of the Royal Army Medical Corps.

ADDITIONAL PAY AND CHARGE PAY FOR R.A.M.C. OFFICERS.

(1) Officer not above the rank of lieutenant-colonel, while acting as specialist in a post considered by the Army Council to merit the grant of additional pay, according to subject or groups of subjects as under.

Operative Surgery, advanced; Medicine; Ophthalmology; Gynæcology and Midwifery; Dermatology and Venereal Disease; Otology, Laryngology, and Rhinology; Radiology; Anæsthetics; Mental Diseases; Hygiene; Pathology; subjects other than above, at the discretion of Our Army Council, 5s. daily.

(2) (*a*) Officer in charge of a hospital.—If the number of quipped beds, as certified by the Deputy Director of Medical ervices, exceeds—

50 beds	2*s.* 6*d.* daily.	300 beds	7*s.* 6*d.* daily.
150 ,,	5*s.* 0*d.* ,,	500 ,,	10*s.* 0*d.* ,,

Officer in charge of a medical or surgical division of a eneral hospital with not less than 300 beds—half the above ates.

	Daily. *s.*	*d.*
) Senior medical officer, Royal Arsenal, not exceeding	10	0
) Officer in command of the depôt, Royal Army Medical Corps	5	0
) The senior officer of the Army Medical Services with an army in the field: A rate to be fixed by the Army Council according to the magnitude of the charge.		
) The officer, if under the substantive rank of colonel, holding the appointment of senior medical officer in a command abroad, or of assistant director of medical services, if the number of soldiers is 1500 or upwards	5	0
) Adjutant R.A.M.C. Depôt	5	0
) Adjutant R.A.M.C. (Territorial Army)	2	6

RETIREMENT AND RETIRED PAY.

The following are the rates of retired pay :—

1. Retired pay will consist of two parts: (*a*) a service lement based on the officer's total service; (*b*) a rank lement for the rank from which the officer retires. An fficer with less than 20 complete years' service will not be ligible to retire voluntarily on service retired pay.

2. The scale will be as follows, subject to the reduction f 7 per cent. referred to below :—

(*a*) Service element.—£15 a year for each completed ear of service as a medical officer.

(*b*) Rank element.—

Rank from which retired.	After completing 1 year's service in the rank.	After completing each additional year's service.	Maximum rank element.
	£	£	£
lajor	12	12	120
ieutenant-Colonel	150	30	240
olonel	290	50	390
lajor-General ..	440	50	540
ieutenant-General	590	50	690

The retired pay of an officer retiring with less than one omplete year's service in the rank from which he retires will e assessed as though he had retired from the rank below.

Maximum rates of retired pay (*a*) and (*b*) together :—

	£		£
aptain and Subaltern ..	300	Colonel	800
lajor	450	Major-General ..	1000
ieutenant-Colonel ..	600	Lieutenant-General	1200

The above rates are those laid down in the Pay Warrant. hey have been reduced by 7 per cent. as from July 1st, 1930, nd are subject to future variation in the ost of living.

3. Officers with seven and less than 20 years' service as edical officers may be permitted to retire with a gratuity in ccordance with the following scale :—

After 7 years' service as a medical officer	£1000
,, 15 ,, ,, ,, ..	£2800
,, 18 ,, ,, ,, ..	£3500

The Army Dental Corps.

This Corps is administered by the Director-General, rmy Medical Services. Regulations for admission o The Army Dental Corps should be obtained from he Under Secretary of State, War Office, and care- ully studied.

OFFICERS: APPOINTMENT AND PROMOTION.

1. Commissions as Lieutenants in the Army Dental Corps ay be given to persons duly qualified under regulations pproved by the Army Council.

2. An officer who is commissioned after holding an pproved whole-time appointment in a recognised civil ental hospital or in the dental department of a recognised ivil general hospital may be granted an antedate covering the period of his appointment, but not exceeding six months, provided that the interval between the termination of the hospital appointment and the date of entry into the Service does not ordinarily exceed six months. The period of such antedate will reckon towards promotion, increase of pay, gratuity or pension.

3. An officer is eligible for promotion to the rank of Captain on completion of three and a half years' service and to the rank of Major on completion of 12 years' service in the Corps, provided he has previously qualified in such manner as may be prescribed by the Army Council.

4. Promotion to the rank of Lieutenant-Colonel and Colonel to fill the establishments laid down from time to time for those ranks is made by selection from those senior in the rank below. Dental officers are also eligible for special promotion by brevet.

PAY.

The following are the rates of pay for officers of the Army Dental Corps.

These rates are 7 per cent. below those shown in the Pay Warrant, 1926, as amended by Army Order 196 of 1926. The latter are subject to revision to an extent not exceeding 20 per cent. according to variation in the cost of living. The next revision takes place on July 1st, 1931.

	Per diem. £	*s.*	*d.*
Lieutenant	0	18	8
Captain	1	3	4
Captain { after 8 years' total service	1	6	0
Captain { ,, 10 ,, ,, ,, ...	1	7	10
Major	1	12	6
Major, after 15 years' total service	1	17	2
,, ,, 18 ,, ,, ,, ...	1	19	6
,, ,, 20 ,, ,, ,, ...	2	4	2
Lieutenant-Colonel	2	11	2
Lieutenant-Colonel after 3 years' service as such	2	15	10
Colonel	3	2	10

CHARGE PAY.

The officer in charge of the Dental Laboratories, Aldershot, receives charge pay at the rate of 5*s.* a day if holding the rank of Captain, or 2*s.* 6*d.* a day if holding the rank of Major.

ALLOWANCES.

The allowances for officers of the Army Dental Corps are at the same rates as for officers of the Royal Army Medical Corps.

RETIREMENT AND RETIRED PAY OR GRATUITY.

(1) The rates of retired pay will be the same as for officers of the Royal Army Medical Corps.

(2) Voluntary retirement on retired pay will not be allowed until after twenty years' servce.

(3) Earlier retirement on gratuity may be allowed :—

After 8½ years'	service as a Dental Officer,	gratuity of £1000.
,, 15 ,,		,, £2000.
,, 18 ,,		,, £3000.

The aim of the Corps is the prevention of wastage on account of dental disease or dental deficiency, and, to enable this to be carried out, every recruit is inspected by a dental officer immediately after joining and all necessary treatment carried out. The soldier is reinspected at least once a year and the dental efficiency maintained at the best standard possible.

INDIAN MEDICAL SERVICE.

IT is the view of many senior officers in the Service that the period of depression is now passing and that the prospect is again bright for those who are fitted in physique and disposition for a medical career in India.

But the new outlook involves frank acceptance of the Indian reform scheme, the essential of which is increasing participation of Indian-born subjects in the government of the country, although, so long as Europeans are employed in the various departments of the Indian Civil Service, nothing is more certain than that there will and must remain European doctors to attend them. India definitely requires European assistance, not only for the care of the military and civil European population, but for the maintenance in the country of that spirit of modern medicine which has accomplished already such

mighty things, and which day by day is spreading in influence and value.

The Government of India issued a communiqué in 1928 dealing in detail with the reorganisation of the medical services in India. The scheme then sanctioned is based on proposals framed in consultation with local governments. The Indian Medical Service, constituted on the same broad lines as at present, will be retained primarily to meet the needs of the Indian army, and in order to maintain two essential requisites —namely, (1) the necessary minimum war reserve of medical officers, and (2) the provision for European medical attendance on officers and their families. Local governments in India will be required to employ a stated number of I.M.S. officers. It has been calculated that the war reserve to be employed by the civil side should consist of 134 British and 66 Indian officers, the larger proportion of British officers being due to the fact that they cannot be recruited on emergency in India from the ranks of private practitioners. Medical attendance on British personnel, and the requirements of civil administration, for which the Central Government is still responsible, involve the provision of a number of employments termed "residuary," the incumbents of which must be retained permanently in civil employment, so as to ensure the continuance under any circumstances of a skeleton staff to cope with civil requirements. Further details regarding the posts on the civil side were published in the Students' number of 1928.

Rules forming an integral part of the reorganisation scheme have been drawn up to safeguard the varied interests of the Indian army, the provincial governments, and the medical officers themselves (vide THE LANCET, May 19th, 1928, p. 1028). Under these it has now been ruled that as long as any Indian Medical Service Officers in civil employ in 1928 remain, the administrative posts will be filled from among them.

Thus the social effect of Indianisation should not press hardly on the medical service for the reason that European doctors will be chiefly requisitioned in stations with considerable European communities. In these communities the equipment and organisation of hospitals has been steadily improving and men with professional ambition will find positions which will satisfy their aspirations. On the military side the station hospital system has rendered the position of medical officers more independent by making teamwork possible and permitting of specialisation in various departments of medicine and surgery. Lastly, those who join now will have unequalled prospect of advancement in a Service which has been so depleted for 10 or 15 years or more, and the terms of service announced by the Secretary of State for India in 1926 assure conditions of pay, pension, and furlough much superior to those previously offered.

THE NEW REGULATIONS.

Competitive examination remains suspended for the present and admission to the Service is on written application to the India Office. As sound bodily health is a first essential candidates may, if they wish it, undergo a preliminary examination by a Medical Board which meets weekly at the India Office.

Candidates must be under 32 years of age at the time of application, and must possess a qualification registered in Great Britain and Northern Ireland, under the Medical Acts in force at the time of appointment. Arising out of the recommendations of the Lee Commission the Secretary of State for India in Council after consultation with the Government of India has decided that the Indian Medical Service constituted on the same broad lines as in the past shall be retained primarily to meet the needs of the Indian Army. In order to maintain the necessary minimum war reserve of military medical officers, and to provide for European medical attendance for European officers of the Superior Civil Services and their families, local governments will be required to employ a stated number of Indian Medical Service officers. The Government of India will draw on the same Service to meet the requirements of the civil administration for which they are responsible. For the present 237 such posts have been reserved, and including the leave reserve will provide employment for 302 officers. 212 of these officers will be British medical men and 90 Indians. As the proportion of European to Indian civil officers diminishes these figures will be subject to periodical scrutiny, and, if necessary, to revision. It will be a definite condition of service for all future entrants to the Service that they will be liable to serve on either the civil or the military side. All officers are required to perform two years' military duty subsequent to permanent appointment before they can be considered eligible for civil employment. Executive medical officers in both civil and military employment may attend persons unconnected with Government service provided their duty admits of it. On the military side however, the opportunities for private practice are not great. Service during the war as a medical or combatant officer, or in a position usually filled by an officer, counts towards promotion and pension and the commissions of officers who before appointment have obtained certain higher qualifications or have held resident appointments in certain hospitals may be antedated by one year.

RATES OF PAY.

The monthly rates of pay for European officers of non-Asiatic domicile in the Service are as tabulated below. The rupee, it may be remembered, has now been definitely stabilised at 1*s.* 6*d.*

Rank and service in rank.	Basic pay.	Overseas pay.	Year of total service.
	Rs.	Rs.	
Lieut.	500	150	First
		150	Second
		150	Third
Captain :—			
1. During first three years' service as Captain.	650	150	Fourth
		£15	Fifth
		£15	Sixth
2. With more than three and less than six years' service as Captain.	750	£25	Seventh
		£25	Eighth
		£25	Ninth
3. With more than six years' service as Captain.	850	£25	Tenth
		£25	Eleventh
		£30	Twelfth
Major :—			
1. During first three years' service as Major	950		
2. With more than three and less than six years' service as Major	1100		
3. With more than six years' service as Major	1250		
Lieut.-Colonel :—			
1. Until completion of 23 years' total service	1500	£30	Thirteenth and over.
2. During twenty-fourth and twenty-fifth years' total service	1600		
3. After completion of 25 years' total service	1700		
4. When selected for increased pay ..	1850		

Note.—Until the completion of 23 years' total service basic pay is regulated according to rank and service in rank (column 1), which, owing to the system of accelerated promotion, may be in advance of the time-scale of promotion. Overseas pay is regulated solely with reference to length of total service (column 4). In addition to the above rates various allowances are admissible for a large number of special appointments on both the military and the civil side which may be held by members of the I.M.S. Special high rates of pay are also attached to the numerous administrative appointments open to officers in both branches of the Service. The appointment of Director-General, I.M.S., which is held by an I.M.S. officer, carries pay of Rs.3500 per mensem. The appointment of Director of Medical Services in India, carrying pay at Rs.3200 per mensem, may also be held by an officer of the Indian Medical Service.

Initial rates of pay are based on the assumption that the majority of newly appointed officers will be bachelors. Officers on arrival in India will be posted for one year to specially selected stations. Officers in military employment, when in command or second-in-command of the larger station hospitals, receive special allowances. On the civil side there are public health, bacteriological, research, and professorial appointments carrying special enhanced rates. Officers on appointment receive an outfit allowance of £50.

PENSIONS AND ALLOWANCES.

The rates of pensions are as shown in the table below.

There are additional pensions not subject to the above reduction ranging from £65 to £350 per annum for officers who have held high administrative appointments as colonels or major-generals.

Service.	Rates per annum.	Service.	Rates per annum.
After 17 years ..	£400	After 23 years ..	£620
„ 18 „ ..	430	„ 24 „ ..	660
„ 19 „ ..	460	„ 25 „ ..	700
„ 20 „ ..	500	„ 26 „ ..	750
„ 21 „ ..	540	„ 27 „ ..	800
„ 22 „ ..	580		

Note.—The above rates are subject to periodical revision upwards or downwards, to an extent not exceeding 20 per cent. in all, on account of a rise or fall in the cost of living, as compared with the year 1919. A deduction of 4½ per cent. on this account has already been made. Nevertheless the full pension of a lieutenant-colonel cannot be cut below the maximum of £700 under the old rules in the case of officers who entered the service before July 1st, 1920.

Officers on appointment are provided with free passage to India, normally by transport. The wives and families of officers who are married prior to the date of the officers' embarkation on first appointment will also be given free passage to India subject to the payment of messing charges. Officers are granted a certain number of return passages home at Government expense during their career. There are special allowances for officers whilst on study leave.

Further particulars can be obtained on application to the Secretary, Military Department, India Office, Whitehall, London, S.W. 1. Letters should be marked "Recruitment for I.M.S."

ROYAL AIR FORCE MEDICAL SERVICE.

THE Air Council attach great importance to attracting into the service the best type of medical man, since on the capacity of the Medical Service depends in a peculiar degree the safety and efficiency of the Air Force. The duties of a medical officer in the Air Force include not only the prevention and treatment of those ordinary diseases to which the personnel of any fighting service are liable, but the special study of the mental and physical stresses imposed on the airman in diverse circumstances and climates—a new branch of medicine which still provides considerable scope for research.

As promotion to the higher ranks of the Service is by selection from officers who are eligible by reason of length of service, and as a certain proportion of the higher ranks will be reserved for purely professional as opposed to administrative appointments, it will be seen that there are excellent prospects for the young medical officer who exhibits ability and energy in his professional work.

The work to be done, therefore, has a high professional interest which, combined with good rates of pay and allowances, offers a career for medical men which should prove both attractive and interesting. The life is one which is certain to appeal to the man of wide outlook who desires opportunities for travel, sport, and games, and can find interest and enjoyment in aviation.

His duties will, as a matter of course, give him flying experience as a passenger, which is necessary for the proper study of the medical problems of aviation and for gaining first-hand knowledge of the conditions under which his comrades serve.

The establishment will consist partly of permanent and partly of short-service officers.

An officer will on first entry be granted a short-service commission for a period of three years on the active list (which may be extended to five years at the discretion of the Air Council if the officer so wishes on the recommendation of the Director of Medical Services) and of four years in the Reserve of Air Force Officers. Selections for permanent commissions will be made from officers holding short-service commissions, and those who are not selected will be transferred to the Reserve at the expiration of their period of service on the active list.

For those entrants who desire it the prospect of obtaining a permanent commission is approximately an even one. Experience has so far shown that the

ROYAL AIR FORCE MEDICAL BRANCH: RATES OF PAY AND ALLOWANCES.

Rank.	Pay.* Daily rates. Standard.	Pay.* Daily rates. Current.	Pay.* Per annum (current rate) from 1/7/1930.	Cash allowances at home rates in lieu of quarters, rations, and servant, if not available in kind (per annum).† Married.	Cash allowances at home rates in lieu of quarters, rations, and servant, if not available in kind (per annum).† Unmarried.	Pay plus allowances per annum. Married.	Pay plus allowances per annum. Unmarried.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Flying Officer	1 4 0	1 2 4	407 11 8	196 3 9	123 3 9	603 15 5	530 15 5
Flight Lieutenant— ..	1 6 0	1 4 2	441 0 10	234 4 2	123 3 9	675 5 0	564 4 7
After 2 years as such..	1 8 0	1 6 0	474 10 0	234 4 2	123 3 9	708 14 2	597 13 9
After 4 years as such..	1 10 0	1 7 10	507 19 2	234 4 2	123 3 9	742 3 4	631 2 11
Squadron Leader— ..	1 14 0	1 11 8	577 18 4	237 5 0	161 4 2	815 3 4	739 2 6
After 2 years as such..	1 18 0	1 15 4	644 16 8	237 5 0	161 4 2	882 1 8	806 0 10
After 4 years as such..	2 0 0	1 17 2	678 5 10	237 5 0	161 4 2	915 10 10	839 10 0
After 6 years as such..	2 4 0	2 1 0	748 5 0	237 5 0	161 4 2	985 10 0	909 9 2
After 8 years as such..	2 8 0	2 4 8	815 3 4	237 5 0	161 4 2	1052 8 4	976 7 6
After 10 years as such..	2 10 0	2 6 6	848 12 6	237 5 0	161 4 2	1085 17 6	1009 16 8
Wing Commander— ..	2 15 0	2 11 2	933 15 10	238 15 5	191 12 6	1172 11 3	1125 8 4
After 2 years as such..	2 17 0	2 13 0	967 5 0	238 15 5	191 12 6	1206 0 5	1158 17 6
After 4 years as such..	3 3 0	2 18 8	1070 13 4	238 15 5	191 12 6	1309 8 9	1262 5 10
Group Captain	3 10 0	3 5 2	1189 5 10	310 5 0	252 9 2	1499 10 10	1441 15 0
Air Commodore	4 0 0	3 14 4	1356 11 8	366 10 5	313 5 10	1723 2 1	1669 17 6
Air Vice-Marshal.. ..	5 0 0	4 13 0	1697 5 0	430 7 11	374 2 6	2127 12 11	2071 7 6

* Except for periods of service under Indian administration. For such periods officers receive pay and allowances at rates and subject to conditions authorised from time to time by the Government of India.

† These allowances are issued only when accommodation, fuel and light, rations, and personal attendance are not available in kind. Normally, provision in kind is available for junior officers. "Married" rates of allowances are payable only to married officers who have reached the age of 30 or the rank of Squadron Leader. A colonial allowance is granted in certain commands abroad. The rates and general scheme of allowances are liable to revision as circumstances may require.

officers selected have included the great majority of those desirous of, and suitable for, retention in the service; owing to the fact that the short-service commission with its gratuity after three or five years is in itself an attraction to many entrants who desire to enlarge their experience and outlook from the point of view of subsequently entering private practice, or who, on entry, have not made up their minds to the adoption of a permanent career in the service and subsequently find that they would prefer to return to civil life.

For certain purposes medical officers may be allowed to count as service their time spent in resident appointments in civil hospitals under certain well-defined and generous conditions.

Officers who have been selected for permanent commissions may be permitted to attend for a period not exceeding nine months a post-graduate course in general medicine and surgery, tropical and preventive medicine, and other special subjects. Such permission may be granted at any time when the exigencies of the service permit during the first 16 years of service, and when attending these courses officers will receive full pay and allowances.

New entrants into the Royal Air Force Medical Service will be commissioned as Flying Officers (Medical) and will be eligible for promotion to the rank of Flight Lieutenant (Medical) after two years' service. Officers selected for permanent commissions will normally be promoted to the rank of Squadron Leader after ten years' total service. Accelerated promotion may be granted in a limited number of cases to officers who show exceptional ability after the completion of eight years' service. Promotion within establishment to the rank of Wing Commander will be by selection at any period after 16 years' total service, and that of Group Captain by selection at any period after 22 years' service.

Certain posts in these ranks are reserved for officers fully employed in professional work, such as surgery, pathology, ophthalmology, &c., numbering at present six in all. The number of these posts will be limited only by the needs of the service and by the necessity of observing a similar proportion between the number of reserved posts and the officers from whom they can be filled, as exists between the total number of higher ranks and the remainder of the medical service. Selections for these reserved posts will be made only from officers professionally qualified to hold them. Officers filling the reserved posts will be eligible for selection to the administrative appointments of their rank, and to the highest administrative appointments.

There will be no competitive examination on entry; candidates must be under 28 years of age, be British subjects, the sons of British subjects, and of pure European descent, be nominated by the dean of a recognised medical school or teaching hospital, and will be interviewed personally by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce :—

1. Birth certificate. 2. Medical registration certificate. 3. A declaration containing the following information: (*a*) Age and place of birth. (*b*) That he is a British subject, the son of British subjects, and of pure European descent. (*c*) That he is ready to engage for general service at home or abroad as required. (*d*) The qualifications he is possessed of, and what medical or other appointments he has held (if any). (*e*) That he is willing to fly as a passenger whenever called upon to do so.

Each candidate will be required, before acceptance, to pass a medical examination to ensure that he labours under no constitutional or mental disease or diseases or weakness, nor any imperfection or disability which may interfere with the efficient discharge of the duties of a medical officer in any climate, in peace or war.

On appointment entrants will undergo an initial course of eight weeks, during which they will be given instruction in the special medical aspects of aviation, the organisation and administration of the Royal Air Force, and the general and special duties to be performed by officers in the Medical Branch.

In order to avoid the necessity for further examinations the position of entrants in order of seniority in the Air Force List will be determined at the end of the initial course by a system of marking and reports on the actual work done during their instruction.

UNIFORM AND EQUIPMENT.

Medical officers are required to provide themselves with the uniform, service dress and mess dress of their rank and with the distinguishing badges of the Royal Air Force Medical Branch. The provision of full dress is entirely optional at present. An allowance of £5 towards the cost of uniform is made on joining to candidates who have not had previous commissioned service in H.M. Forces.

EMOLUMENTS.

The emoluments of medical officers of the Royal Air Force are given in outline above. The standard rates of pay and retired pay were drawn up on the basis of the high cost of living in 1919, and 20 per cent. on each of the standard rates is detachable and subject to alteration upwards or downwards in relation to the increase or decrease of the cost of living above or below the cost in July, 1919. Under this provision the current rates in force from July 1st, 1930 represent a reduction of approximately 7 per cent. on the standard rates. The next revision will take effect from July 1st, 1931.

Retired Pay.

The minimum period of service qualifying for retirement on retired pay is 20 years. Standard rates of retired pay are as follows :—

AIR OFFICERS.

Air Vice-Marshal ..	.. £790 to £1010 per annum.
Air Commodore ..	.. £650 „ £950 „ „

The maximum standard rates of retired pay and the compulsory retiring ages for the several ranks are :—

Rank.	Yearly rate of retired pay.	Compulsory retiring age.
	£	
Air Vice-Marshal ..	1010	60
Air Commodore ..	950	57
Group Captain.. ..	900	55
Wing Commander ..	600	51
Squadron Leader ..	500	48

OFFICERS BELOW AIR RANK.

Age on retirement.	Standard yearly rate of retired pay.	Years of service.	Addition for each extra year of service.*	Deduction for each deficient year of service.*
	£		£	£
40	300	17	15	15
41	337	17	15	15
42	375	18	15	15
43	412	18	15	15
44	450	19	15	15
45	487	19	15	15
46	525	20	15	15
47	562	20	15	15
48	600	21	15	15
49	637	21	15	15
50	675	22	15	15
51	697	22	22	15
52	720	23	22	15
53	742	23	22	15
54	765	24	22	15
55	790	24	22	15

* Limited to five years.

Gratuities.—A permanent officer allowed to retire before having qualified for retired pay may be granted a gratuity provided he has not less than ten years' commissioned service, namely :—

£1500 if he has 10 but less than 15 years' commissioned service
£2500 „ „ 15 or more than 15 „ „ „

Short-service officers will be eligible on passing to ne Reserve for gratuities on the following scale: 100 for each of the first two complete years of service, 150 for each of the third and fourth complete years, nd £200 for the fifth complete year; that is:—

For three years' service on the active list	.. £350
For five " " " " "	.. £700

hese gratuities will not be payable to officers ranted permanent commissions, but their service n a short-service commission will count towards etired pay.

COLONIAL MEDICAL SERVICE.

In the self-governing Dominions (Canada, Australia, lew Zealand, the Union of South Africa, the Irish ree State, and Newfoundland), and territories under neir control, such as Papua and the Cook Islands and n the self-governing colony of Southern Rhodesia, nedical appointments are made concerning which nformation can be obtained from the High Comnissioners or Agents-General in London; application or appointments in North Borneo should be made to ne British North Borneo Company, 17, St. Helen's-lace, E.C.; appointments in Sarawak are in the ands of H.H. the Rajah. Much valuable information ill be found in the "Professional Handbook," art II., issued by the Oversea Settlement Office, axton House, Tothill-street, London, S.W. 1, price 9*d*.

As a general rule, each Colony or Protectorate has s own public service distinct from that of every ther; and it is usually only the higher officers who re transferred by the Secretary of State from one olony to another. There are three exceptions to nis rule: (*a*) The West African Medical Staff, which erves Nigeria, the Gold Coast, Sierra Leone, and the ambia, is one service. (*b*) The East African Medical ervice, which serves Kenya, Uganda, Zanzibar, yasaland, Somaliland, and the Tanganyika Terriory, is one service. (*c*) In practice the medical serices of the Straits Settlements and the Malay States nay be regarded as one, as the officers may be and equently are transferred from the Colony to the tates or vice versa; the two services are now called ne Malayan Medical Service.

The Colonies, Protectorates, and Mandated Territories to which medical officers are appointed by the ecretary of State for the Colonies are (*a*) the West frican—viz., Nigeria, the Gold Coast, Sierra Leone, nd the Gambia, with the Mandated Territories of ogoland and the Cameroons; (*b*) the East African—iz., the Kenya Colony and Protectorate, Uganda, yasaland, Somaliland, and Zanzibar Protectorates, ne Tanganyika Territory, and Northern Rhodesia;) the Eastern—viz., Ceylon, the Straits Settlements nd Malay States, Hong-Kong, Mauritius, and eychelles; (*d*) the West Indian—viz., Jamaica, rinidad, the Windward Islands, the Leeward slands, Barbados, and the Bahamas; (*e*) Fiji and ne Western Pacific, Cyprus, Gibraltar, St. Helena, ritish Guiana, British Honduras, Bermuda, and the alkland Islands; and (*f*) Palestine.

In Ceylon, Mauritius, Jamaica, Barbados, the ahamas, and Bermuda vacancies are practically lways filled locally by the appointment of qualified ative candidates, or—in the case of some of the igher posts—by transfer from other Colonies. n the Bechuanaland Protectorate, Basutoland, and waziland appointments are usually filled locally. ppointments in Malta are all filled locally. In ddition, certain medical appointments in the service f the Government of Iraq are filled upon the recomendation of the Secretary of State. Vacancies ccur most regularly and frequently in the West frican Medical Staff, the East African Medical ervice, and the Straits Settlements and Malay States.

All applicants for medical appointments in the gift f the Secretary of State for the Colonies should be nder 35 years of age, and must be doubly qualified; preference will be given to those who have held hospital appointments as house physicians and house surgeons; testimonials to character and professional competence will be required, and every officer before being definitely appointed will be medically examined by one of the consulting physicians of the Colonial Office: Dr. P. H. Manson-Bahr, D.S.O., F.R.C.P., 9, Weymouth-street, Portland-place, W.1, and Dr. A. E. Horn, C.M.G., 14, Wimpole-street, W. 1; Dr. H. C. Drury, 48, Fitzwilliam-square, Dublin; Dr. Foster Coates, 22, College-gardens, Belfast; and Lieut.-Colonel Glen Liston, C.I.E., I.M.S., 33, Comely Bank, Edinburgh, and Dr. G. E. H. Le Fanu, 33, Rodney-street, Liverpool. Applications for such appointments must be addressed to the Private Secretary (Appointments), Colonial Office, 2, Richmond-terrace, Whitehall, S.W.1.

Instruction in Tropical Medicine.—Every candidate selected for appointment will, unless the Secretary of State decides otherwise, be required to undergo a course of instruction at the London School of Hygiene and Tropical Medicine, Endsleigh-gardens, W.C.1, the Liverpool School of Tropical Medicine, Liverpool University, or at Edinburgh University. The cost of tuition will be borne by the Government, but candidates must make their own arrangements for board and lodging; an allowance of £25 a month will be paid to them monthly in arrear while they are under instruction. Payment of the allowance will be made subject to the candidate signing an agreement by which he is bound to refund it (1) if he declines to accept an appointment in any of the Colonies for which he may be selected; (2) if he fails to obtain a certificate or diploma; (3) if he leaves the Service within three years for any reason other than mental or physical infirmity not caused by his own misconduct.

West African Medical Staff.

Applicants for appointment as medical officers or medical officers of health in the West African Medical Staff (the higher grades will usually be filled by promotion from the lower) must be British subjects of European parentage and between 23 and 35 years of age; preference is given to candidates who are over 25 years of age. Applicants must possess a complete double qualification, and must be on the Medical Register. Passages for wives and children are not provided by the Government, and houses for the wives of junior medical officers are rarely available. Officers are not usually allowed to take their wives and young children out with them until they have acquired experience of the local conditions and have obtained the sanction of the Governor. When an officer has obtained permission to be accompanied by his wife a grant of one-half the cost of his wife's passage to and from West Africa is made subject to certain conditions.

Candidates are allowed to express a preference for any particular Colony, and their wishes in this respect will be borne in mind and met as far as possible, but they are liable to be posted in the first instance, or transferred afterwards if necessary to any other West African Colony at the discretion of the Secretary of State. Candidates who wish to be posted to Nigeria will probably find it useful to be able to ride. Transfers from one Colony to another will be made as seldom as possible. Candidates should on no account apply for, or accept, a West African appointment in the expectation of ultimately being transferred.

Those transferred to pensionable Crown appointments elsewhere than in West Africa do not forfeit their claim to pension in respect of their West African service on final retirement, provided that they have been members of the staff for at least 12 months. Every officer selected for appointment is required to have himself revaccinated before proceeding to West Africa, unless one of the medical advisers of the Colonial Office certifies that this is unnecessary.

Leave of Absence.—European officers in West Africa may be granted vacation leave on full salary

not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United Kingdom, and, if the officer is returning to West Africa for further service, the time necessarily taken on the journey from the United Kingdom to the Colony. Vacation leave may be granted without any special grounds after 18 consecutive calendar months of residential service in West Africa. An officer will not be required to serve a tour of more than 24 consecutive calendar months' residential service except in special circumstances; and the Governor may grant vacation leave to any officer at any time after he has completed 12 consecutive calendar months' residential service within the above limits, the actual length of each officer's tour will be at the discretion of the Governor. Vacation leave on full salary may also be granted to an officer if he is invalided from West Africa after less than 12 consecutive calendar months' residential service, and sick leave on full salary may be granted for any period not exceeding six calendar months.

Appointments and Salaries.—Medical officers for the West African Colonies and Protectorates—namely, the Gambia, Sierra Leone, the Gold Coast (including Ashanti and the Northern Territories), and Nigeria (Southern and Northern Provinces)—are selected by the Secretary of State for the Colonies, and are on one list for employment and promotion. The grades and emoluments of the Staff are at present as follows:—

The Director of the Medical and Sanitary Service, Nigeria, receives a salary of £1800 a year, with a duty allowance at the rate of £360 a year. The Director of Medical and Sanitary Service in the Gold Coast receives a salary of £1600 a year, with a duty allowance at the rate of £320 a year. The Director of Medical and Sanitary Service in Sierra Leone receives a salary of £1400 a year, with a duty allowance at the rate of £280 a year. The Deputy Director of Medical and Health Service, Nigeria, and the Deputy Director of Health Service, Nigeria, receive salaries of £1500 a year, with duty allowances at the rate of £300 a year. The Deputy Director of Medical and Health Service, Gold Coast, the Deputy Director of Health Service, Gold Coast, and the Assistant Directors of Medical and Health Service, Nigeria, receive salaries of £1400 a year, with duty allowances at the rate of £280 a year. Assistant Directors Medical Service: There are six appointments on this grade, four in Nigeria, two in the Gold Coast. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. The Assistant Director of Health Service, Nigeria, the Assistant Director of Health Service in the Gold Coast, and the Deputy Director of Health Service in Sierra Leone receive salaries at the rate of £1300 a year, with duty allowances at the rate of £260 a year. Specialists: The number of these appointments is not fixed, officers of outstanding professional merit being eligible for appointment. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. After five years' approved service as such, the specialist officer is eligible to receive a salary at the rate of £1400 a year, with duty allowance at the rate of £280 a year. There are at present five officers appointed specialists in Nigeria, three in the Gold Coast, and one in Sierra Leone. Senior Medical Officer: There are twenty appointments of this grade, with salary at the rate of £1000 a year, rising by annual increments of £50 to £1150 a year, and seniority allowance at the rate of £100 a year. The Senior Medical Officer, Gambia, is allowed "staff pay" of £150 a year, in addition to duty allowance, but he is debarred from private practice. Senior Health Officer: There are eight appointments of this grade, with salary at the rate of £1050 a year, rising by annual increments of £50 to £1200 a year, and a duty allowance at the rate of £210 a year. Possession of the Diploma in Public Health is usually required for appointment to this grade. Special facilities are granted to study for the diploma during leave. Medical Officers of Health: There are at present 29 appointments of this grade. The salary scale is the same as that of Medical Officers, except that Medical Officers of Health are granted an initial salary at the rate of £800 a year, together with seniority allowance at the rate of £72 a year and staff pay at the rate of £150 a year, half of which is payable during leave. After three years' service on the maximum of the scale, viz., £960 a year, and on undergoing an approved course of study, Medical Officers of Health are eligible, if unpromoted, subject to the recommendation of the Governor, to be placed on the scale £1000 a year rising by annual increments £50 to £1150 a year, together with seniority allowance the rate of £100 a year and staff pay as before. The holde of these appointments are not allowed private practic Candidates selected for service as Medical Officers of Heal must obtain the Diploma in Tropical Medicine and Hygie of Cambridge, London, or Liverpool as a condition of appoin ment, or must be in possession of the Diploma in Publ Health. They are appointed subject to the condition tha if after a period of service in West Africa they are consider unsuitable to serve in that capacity, they may be called up to transfer to the medical side. In such cases the office are given the rate of salary which they would have reach if they had been appointed to be Medical Officers instead Medical Officers of Health in the first instance. Medic Officer: The salary attached to this grade is at the rate of £6 a year, rising by annual increments of £30 to £720 a yea Then, if confirmed in the appointment, £720 a year, rising annual increments of £40 to £960, with seniority allowance the rate of £72 a year. Before passing £800, medical office are required to take a special course of study for three month If they obtain satisfactory certificates at the end of t course they draw their further increments up to £960 a yea

A medical officer who has served for three years the maximum salary of this scale (£960) witho obtaining promotion is eligible, if recommended the Governor, to be placed on the scale £1000–£5 £1150, with £100 seniority allowance (as for Seni Medical Officers).

Special Appointments.—The Director of the Medic Research Institute, Lagos, and the Director the Medical Research Institute, Accra, receive a sala of £1300 a year, with a duty allowance of £260 year, rising after five years' approved service to salary at the rate of £1400 a year and duty allowan at the rate of £280 a year. There are a number appointments for pathologists and bacteriologists Nigeria, the Gold Coast, and Sierra Leone. The sala and other conditions attached to these posts are simil to those of Medical Officers of Health. Duty allo ances, seniority allowance, and staff pay are n pensionable emoluments.

Increments.—Increments to salaries are payab only when the service of an officer during the peri of employment qualifying for increment is approve

Payment of Salaries.—Information as to the pa ment of officers' salaries or of monthly remittances persons in England may be obtained from the Crow Agents for the Colonies, 4, Millbank, S.W. 1. allowances are paid locally.

All officers of the staff, except directors, depu directors, assistant directors, senior sanitary office medical officers of health, research officers, and few other officers holding special appointmen are at present allowed to take private practi provided that it does not interfere with the faith and efficient performance of their official duties, b it is within the power of the Governor to withdr or suspend the privilege in such places and such periods as he may consider desirable. Priva practice does not exist at many stations, and guarantee can be given that an officer will be post to a station in which he will be able to practi privately. As a general rule, and subject to t exigencies of the service, stations where there private practice are allocated to senior members the Staff.

Pensions and Gratuities.—Pensions and gratuities retirement are granted in accordance with the law a regulations of each individual Colony.

African Medical Officers.—In addition to t membership of the West African Medical Staff, whi is limited to British subjects of European parenta there are a number of Government appointments f African medical officers in the West African Coloni These appointments carry a salary on the scale £50 20–£600, and there is a higher scale, £600–30–£7 In addition, in Nigeria and on the Gold Coast, arran ments have been made for the employment of a f young African medical men temporarily on the h pital staffs, with a view to appointment to the Gover ment service later, if suitable. In such cases a sala of £400 a year is paid.

East African Medical Service.

The Medical staffs of the Kenya Colony and Protectorate, the Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, and the Tanganyika Territory form one service, the members of which are liable to be posted or transferred to any of the Dependencies as the exigencies of the service may require. The preferences of individual officers are, however, taken into consideration as far as possible.

Selected candidates are appointed as medical officers on probation in the first instance for two years, at the end of which period their appointments are made permanent if their service has been satisfactory. Medical officers (but not health officers) are permitted to take private practice at some stations on the understanding that they give precedence to their official duties. It must be understood that additions to their income from this source are not likely to be substantial, and that the privilege is liable to withdrawal at any time.

Officers are provided with quarters free of rent or the Government may provide temporary accommodation, or an allowance in lieu of quarters may be paid. The salary of a medical or sanitation officer is £600 per annum, rising by annual increments of £30 to £840, and thence by increments of £40 to £920, subject to an efficiency bar at £840. Senior medical officers and senior sanitation officers are paid on the scale £1000 by annual increments of £50 to £1100. Officers who possess the Diploma in Public Health on entering, or who acquire it while in the Service, receive two special increments in the scale.

Officers of the East African Medical Service are permitted to retire with gratuity, if they wish, instead of waiting to retire on pension as follows: (*a*) After nine years' service, of which at least six must have been spent in East Africa, £1000; (*b*) after 12 years' service, of which at least eight must have been spent in East Africa, £1250. If an officer elects to retire with gratuity he thereby forgoes all claim to pension.

The grades and salaries (apart from ordinary medical and sanitation officers) in the medical departments are as follows:—

Kenya.—Director of Medical and Sanitary Services, £1500; Deputy Director of Medical Service, £1200; Deputy Director of Sanitary Service, £1200; Deputy Director of Laboratory Service, £1200.

Uganda.—As Kenya.

Tanganyika Territory.—As Kenya.

Nyasaland.—Director of Medical and Sanitary Services, £1300; Medical Entomologist, £1000–£50–£1100.

Zanzibar.—Director of Medical and Sanitary Services, £1400; Deputy Director of Sanitary Service, £1200; Resident Surgical Officer, £1000–£50–£1100.

Somaliland.—Principal Medical Officer, £1000–£50–£1100.

There are also the following posts:—Resident Surgical Officers (Kenya and Uganda), £1200; Specialist Officer, Sleeping Sickness (Uganda), £1150; Medical Superintendent and Principal of Medical School, Mulago Hospital (Uganda), £1150; Sleeping Sickness Officer (Tanganyika Territory), £1000–£50–£1100; Senior Bacteriologists (Kenya and Uganda), £1000–£50–£1100.

Health officers are selected from the ranks of medical officers as occasion arises.

Asia.

Straits Settlements and Federated Malay States.—European medical officers are appointed on the following scale of salaries: $500 per mensem, rising to $550 per mensem during three years' probation; then, if they are placed on the pensionable establishment, rising to $575 per mensem, and thence by annual increments of $25 per mensem to $800 per mensem, with a strict efficiency bar at $600 per mensem. Officers possessing the D.P.H. receive an additional allowance (non-pensionable) of $100 per mensem.

Above the concluding figure of $800 per mensem there are certain higher appointments, as follows: Principal Civil Medical Officer, Straits Settlements, and Principal Medical Officer, Federated Malay States, $1200 per mensem each; Director, Institute for Medical Research, Federated Malay States, Chief Health Officer, Federated Malay States, and Principal, Medical College, Straits Settlements, $1100 per mensem each; 12 posts at $1050 per mensem; and 29 posts at $850 per mensem, rising annually by $30 to $1000 per mensem.

The following temporary allowances are at present paid to all officers recruited from Europe in the Government Services of the Straits Settlements and Federated Malay States: unmarried officers, 10 per cent. of salary; married officers, 20 per cent. of salary. Private practice by Government medical officers is not allowed, but consultation work with another practitioner is permitted. Information about general conditions in Malaya is obtainable from the Malayan Information Agency, 57, Charing Cross, S.W. 1.

Seychelles.—The chief medical officer receives Rs.8000 per annum and the resident surgeon Rs.6500 per annum. There are two assistant Government medical officers, one receiving Rs.6500, the other Rs.4500 per annum.

Hong-Kong.—The present establishment of the medical department is: director of medical and sanitary services £1500–£50–£1800; deputy director £1300–£50–£1400; senior medical officer, £1200–£40–£1280; senior health officer, £920–£40–£1280; five health officers, £860–£40–£1220; health officer of port, £920–£40–£1280; second health officer of port, £860–£40–£1220; eight medical officers, £700–£40–£1180; malarial research officer, £1280; bacteriologist, £920–£40–£1280; assistant bacteriologist, £860–£40–£1220; radiologist, £860–£40–£1220. The currency of Hong-Kong is based on the silver dollar. For purposes of local payment salaries fixed in sterling are converted into dollars at the current rate of exchange. If quarters are provided rent is charged. In certain instances a rent allowance is paid instead.

America.

British Guiana.—There are the following posts in the medical service of the Colony: one surgeon-general, £1000–£1200 per annum, with consulting practice; one medical officer of health, £900; ophthalmologist, £700; one bacteriologist and pathologist, £700; 30 medical officers at £500–£25–£700. Most of the senior posts in institutions carry duty allowances (varying from £50 to £300 per annum) and quarters.

Trinidad and Tobago.—In Trinidad and Tobago there are about 40 appointments. Government medical officers receive salary at the rate of £400 per annum, rising by annual increments of £25 to £600. An officer appointed to a district receives, in addition to his salary, a travelling allowance varying from £100 per annum in a normal district to £150 per annum, and is allowed private practice, the value of which is estimated at from £50 to £800 per annum. Officers employed in institution work receive a duty allowance varying from £50 to £300. Medical officers having completed 10 years' resident service are pensionable at the age of 55.

Windward Islands (Grenada, St. Lucia, St. Vincent). There are over 25 appointments. The chief medical officer, Grenada, receives £750, and also an allowance of £50 as bacteriologist. The chief medical officer, St. Lucia, receives £600–£700 plus forage and subsistence allowances; the post is pensionable, but private practice is not allowed except as a consultant. The chief medical officer, St. Vincent, receives £500–£600, with free quarters valued at £40. Most of the remaining appointments are district appointments with the right to private practice attached; the salaries paid by Government are, in Grenada, on the scale £500–£600, in St. Lucia, £400–£500, in St. Vincent, £400–£450. The Governor has the power to transfer a medical officer from one island to another. Appointments are pensionable.

Leeward Islands (Antigua, St. Christopher and Nevis, Dominica, Montserrat, Virgin Islands).—The

appointments are similar in number and character to those in the Windward Islands, and are pensionable. An officer when first sent out is not appointed to a particular island but to the service of the Leeward Islands, with a salary of £350, and is later appointed to a definite district at a salary varying from £312 to £400–£25–£450, and the Governor decides as to the district which is to be allotted to him, according to station. He is liable to be transferred at the Governor's discretion to any medical district in the Leeward Islands. The medical officers, except in St. Christopher and Nevis, receive fees for successful vaccinations, post-mortem examinations, evidence at courts of justice, certificates of lunacy, and, in the larger islands, for burial certificates. They are also, as a rule, allowed private practice. The chief medical officer, St. Christopher and Nevis, receives £700–£25–£750, but is not allowed private practice, except as a consultant.

British Honduras.—There are seven medical appointments (besides the post of principal medical officer) at a salary of $2430 per annum with increments of $120 to $3150. Unless they already possess a diploma of public health, medical officers are liable to be required, before they join the colony, to undergo a course of instruction at a laboratory of public health or analogous institution. The value of the dollar is the same as that of the United States dollar. The appointments are pensionable.

Other Overseas Appointments.

Fiji.—The Chief Medical Officer receives £1000–£50–£1100, with free quarters, partly furnished; the Medical Superintendent, Colonial War Memorial Hospital, £800–£25–£1000, and free quarters; the Medical Superintendent, Leper Asylum, £700–£50–£950, with completely furnished quarters and one servant; the Medical Officer of Health, £750–£25–£900, no quarters provided; Assistant Medical Superintendent, Colonial War Memorial Hospital, £500–£25–£725. There are 14 District Medical Officers who receive £500–£25–£725, with partly furnished quarters or £50 house allowance (at the option of the Government) and duty allowance of £50 per annum in districts where no private practice exists. In certain districts house allowances or car allowances are granted. In others a medical officer is provided with a launch or boat. District Medical Officers are allowed private practice on the understanding that their official duties are not neglected. In four districts the Medical Officer is also District Commissioner and receives an additional allowance of from £175 to £275 and free partly furnished quarters. In most districts there is private practice, the value of which has been estimated at from £100 to £600 a year.

Western Pacific High Commission.—The staff in the British Solomon Islands Protectorate consists of a Senior Medical Officer (£700–£50–£900), one Assistant Medical Officer (£550–£650), and one Travelling Medical Officer (£550–£650). Partly furnished quarters are provided and a local allowance of £50 per annum is paid to the Senior Medical Officer and the Assistant Medical Officer. A local allowance of £50, consolidated travelling and subsistence allowance £200, and partly furnished quarters are provided for the Travelling Medical Officer.

In the Gilbert and Ellice Islands Colony there is a Senior Medical Officer (£650–£750), with partly furnished quarters, and one Medical Officer (£600–£25–£650), with partly furnished quarters or house allowance. There is hardly any private practice in the British Solomon Islands Protectorate or the Gilbert and Ellice Islands Colony.

Cyprus.—There is a chief medical officer paid at the rate of £750, rising by annual increments of £25 to £850, and three district medical officers paid at the rate of £500 a year, rising by annual increments of £20 to £600 a year, all enjoying private practice (except the chief medical officer and one of the district medical officers, who are allowed consulting practice only). There is also a post of consulting surgeon £400–£20–£600 a year, with consulting practice. There is also a medical officer of health on £600 rising by £20 increments to £750 without private practice, and a specialist in venereal diseases with a salary of £700 a year and consulting practice; these are the only medical appointments open to British candidates.

Gibraltar.—There is a surgeon of the Colonial Hospital receiving £730, and private practice. There are also two assistant surgeons with a salary of £60 for 3 years and thereafter £650–£25–£700 per annum who are allowed private consulting practice only. Free quarters, unfurnished, are provided for all three officers.

St. Helena.—The colonial surgeon at present receives £550 per annum, fees estimated at about £2 a year, and £30 horse allowance. The assistant colonial surgeon at present receives £500 a year and £30 horse allowance. Private practice is allowed, and such practice, together with the duties of non-Government appointments, is divided between the colonial surgeon and the assistant colonial surgeon in a proportion approved by the Governor. The value of private practice and appointments is estimated at about £536 a year.

Falkland Islands.—There are two appointments. The principal medical officer is paid at the rate of £800 per annum, with free furnished quarters and £200 in lieu of private practice. The medical officer is paid at the rate of £500 per annum, with an allowance of £50 per annum in lieu of quarters, and is allowed private practice. The offices are pensionable.

Palestine.[1]—The grades and salaries of higher appointments in the Department of Health are: Director, £P.1200, plus £P.200 expatriation allowance; Deputy Director, £P.900–50–£P.1100, plus £P.150 expatriation allowance. Assistant Director (Laboratories), Specialist Surgeon,[2] and five Senior Medical Officers, £P.750–25–950, plus £P.100 expatriation allowance. One Senior Medical Officer and Government Analyst, £P.550–25–750, plus £P.100 expatriation allowance. The remainder of the staff is recruited locally. A temporary and variable cost-of-living allowance is at present payable in addition to the salaries stated above.

Iraq.—The grades and salaries of the principal appointments in the Department of Health are: Inspector-General of Health, Rs.1800–100–2800 a month; Health Specialists, Directors of Hospitals and Institutes, Chief Medical Officers in Mosul and Kirkuk, Medical Officers of Health in Baghdad and Basra, Rs.1500–75–1800–100–2300 a month; Medical Officers, Rs.1200–75–1800 a month. Posts in the service of the Government of Iraq are not pensionable. Every officer (unless serving on a 3 years' contract) is required to contribute one-twelfth of his pay to a provident fund, to which the Government makes a contribution equal to one-sixth of his pay.

Leave and Pensions.

Leave and Passages.—Leave of absence in East Africa. The normal tour of service is 20 to 30 months (less in Somaliland) after which leave is granted with full salary for 2½ to 3½ days, according to the districts in which the officer has served, for each month of service, plus the period of the voyage to England. If the officer is returning to East Africa for further service, he receives a further similar amount of leave, plus the period of the voyage to East Africa. Extensions of leave with full salary are given in case of sickness or in the case of officers attending approved courses of instruction. In addition to the above, local leave may be granted up to 14 days a year. Officers serving in Northern Rhodesia are allowed four (or two) days' leave in respect of each month of service. Free first-class passages are provided for the officer on first appoint-

[1] £P.1 = £1 sterling.

[2] A certain amount of private practice is allowed.

ent and on leave, and in certain cases assistance wards family passages is given.

In Malaya eight months' full-pay leave is normally anted: (*a*) after a tour of four years' resident rvice during the first eight years of resident service;) after a tour of three years' resident service during ie next six years of resident service; (*c*) after a ur of two and a half years' resident service after years' resident service. Additional leave on lf-pay may be granted on special grounds. Officers e provided with free passages on first appointment r themselves and their families (i.e., wife and ildren up to five persons, inclusive of the officer). nder temporary regulations at present in force, ee return passages on leave to all officers (and their ives and their children under the age of 10) irrespec- ve of salary.

In other Colonies outside Tropical Africa, subject the necessities of the service, leave of absence on lf salary may be granted after a period of three ars' resident service without any special grounds. may be given before the expiration of that period in se of serious indisposition, or of urgent private fairs. In the absence of special grounds, the leave ust not exceed one-sixth of the officer's resident rvice; on special grounds it may exceed that period six months. In addition to the above, vacation ave on full pay may be granted, if no inconvenience expense is caused thereby, not exceeding three onths[3] in any two years. British Guiana, Jamaica, d Trinidad officers are allowed to accumulate ll-pay leave at the rate of six weeks for each year's rvice up to six months, exclusive of the period of e voyages to and fro, and no leave of absence ay (except in very special circumstances) exceed x months in all unless the officer has served for e years or more without leave, in which case two onths on half-pay may be taken in addition to x months' full-pay leave.

On first appointment an officer will, except in e case of a few Colonies possessing Representative semblies, be provided by the Crown Agents for the lonies with free passages to the Colony for himself d his wife and children, if any, not exceeding four rsons besides himself. The officer so appointed ll be required to execute an agreement binding him repay the cost of the passage or passages so obtained the event of his leaving the Government service thin three years. An officer taking leave out of e Colony has in most cases to provide his own ssages.

Pensions.—East Africa.—Officers on the pensionable establishment may retire (or be retired by e Government) on attaining the age of 50 years; t they may be retained in the service, with their n consent, for such further period as the Govern- ent may recommend. Earlier retirement in the ent of ill-health is also provided for. Pension computed at one-four hundred and eightieth of nsionable emoluments—i.e., salary and value of free arters [4] in respect of each month's pensionable rvice—at the time of retirement, subject to an erage of emoluments for the last three years before irement instead of the actual emoluments at the ne of retirement being taken as the basis for lculation in certain circumstances.

Other Colonies.—In most of the other Colonies an ficer holding a pensionable appointment may be owed in the case of ill-health to retire on a pension ter ten full years' resident service; otherwise he ust have attained the age of 55. For ten full years' sident service fifteen-sixtieths of the average annual lary of the retiring officer's fixed appointments for ree years prior to retirement may be awarded, to hich one-sixtieth may be added for each additional ar's service; but no addition will be made in respect of any service beyond 35 years. For pension purposes absence on vacation leave counts as full service, and leave on half-pay as half service. In a few cases the retiring age is 60 and the pension after ten years' service is ten-sixtieths instead of fifteen. In the Straits Settlements and Malay States, an officer may, with the consent of Government, retire at age 50. Pensions are calculated on a basis of length of service in months instead of years.

[3] Or, in the case of Fiji and the Western Pacific and the Falkland Islands 4½ months in any three years.

[4] The value of free quarters for pension purposes is taken as 10 per cent. of the minimum salary of the grade in which an officer is serving at the time of retirement, subject to a maximum of £150.

Sudan Medical Service.

This Service is responsible for carrying out civil, medical, and public health duties in the Sudan.

The staff consists of: (*a*) A Director, pay £E.1500–£E.2000. (*b*) A Senior Physician and a Senior Surgeon to the Khartoum and Omdurman Civil Hospitals, each with a pay of £E.1200–£E.1750. (*c*) An Assistant Director. (*d*) Medical Officer of Health, Khartoum Province, at a special rate of pay. (*e*) 31 British "Senior Medical Inspectors" and "Medical Inspectors" whose pay commences at £E.720 and rises, subject to the recommendation of the Director, by five biennial increases to £E.1080, and after 13 years' service to £E.1200. The Senior Medical Inspectors are eligible, by selection, for the four senior posts. All Medical Inspectors are appointed, in the first place, on probation for two years, and if at the end of that time they are accepted for permanent service under the Sudan Government, the first increase of pay is subject to their passing an examination in Arabic.

In addition to the above there are (*f*) a number of Medical Officers trained at one of the Syrian Medical Schools, besides (*g*) Sudanese Medical Officers trained at the School of Medicine at Khartoum. There are several native (*h*) Assistant Medical Officers, who have been given a purely practical training in one of the larger hospitals in the Sudan.

Amongst the attractions of the Service are: The great variety of the work met with among many different races of the Sudan; *leave* of 90 days, generally granted every year after the first 18 months of service; *study-leave*, which may be given for some definite purpose, whilst two years towards pensionable service may be granted to those who have special qualifications and experience. The pension for Medical Inspectors who retire after 20 years' service is not less than £E.500 a year. If, however, he serves for a longer period, or is appointed to one of the higher posts, he will receive a larger pension. Private practice is allowed, but is limited to a few of the larger towns, and may be carried on so long as it does not interfere, in any way, with official duties. These duties include acting as consultant to the principal hospitals and the supervision of medical and public health work, the inspection of schools, the examination of candidates for Government service and pension, and the training of Assistant Medical Officers and native Sanitary Overseers. The Khartoum Medical School is staffed mainly by members of the Medical Service, who receive additional remuneration for their work as teachers. A Registrar of the Medical School is also selected from the Service, who receives £E.250 a year extra pay.

The country is developing rapidly, and the Medical Department is being increased to meet its growing requirements. Vacancies are always advertised in THE LANCET as they occur.

Candidates must be single and should be under 30 years of age, and they must have held a resident post, preferably that of house surgeon, in a large general hospital. As a rule they are required to take out a course in Tropical Medicine before they leave England for the Sudan. The fees for this course are paid by the Sudan Government, and in addition an allowance £25 per month is made, under certain conditions, to each selected candidate who attends it.

Inquiries for further information should be made to Dr. V. S. Hodson, 24, Welbeck-street, London, W.1, or to the Deans of the Principal Medical Schools.

WOMEN'S MEDICAL SERVICE FOR INDIA.

AMONG careers open to medical women abroad the Women's Medical Service for India deserves honourable mention. The Service is open to fully qualified medical women of British or Indian nationality, and with the present amount of Government subsidy the number of medical officers is limited to 44. Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India. On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language. For a further period they are appointed to act temporarily for medical women on furlough. They are then definitely appointed to the charge of hospitals. Private practice is allowed, provided it does not interfere with official duties. The only exception is in administrative or educational posts, when an allowance in lieu of practice is given. The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year.

Rates of pay are as follows :—

Years of service.	Overseas allowance per mensem.	Salary per mensem.	English equivalent* per annum.
1 to 3	Rs.100	Rs.450	£440
4 to 6	,,	Rs.500	£480
7 to 9	,,	Rs.550	£520
10 to 12	,,	Rs.600	£560
13 to 15	Rs.150	Rs.650	£600
16 to 18	,,	Rs.700	£640
19 to 21	,,	Rs.750	£680
22 to 24	,,	Rs.800	£720
over 24	,,	Rs.850	£760

* At rupee value 1*s.* 4*d.*

Furnished quarters are provided, representing an additional Rs. 150 per mensem.

Excellent opportunities for surgery—especial gynæcological—are found in the Women's Medic Service. To those who are not keen surgeo opportunities are likely to open in the future connexion with maternity and child welfare.

The cost of living in India is much higher th formerly, but it should be possible for a medic woman (with house provided) to meet actual hous hold expenses for about Rs.300 per mensem, leavi the remainder of her salary for dress and perso expenses. To this must be added the necessa saving to meet additional expense for furlough a leave spent in the hills.

Leave on average pay is earned at the rate of 2/11t of the period spent on duty.

Study-leave is granted to the extent of 12 mont in the total service and will not be granted more th twice in the course of an officer's service. Duri study-leave an officer draws half average pay, with study allowance at the rate of 12*s.* a day duri the course of study. Officers of European domic are entitled to four free return first-class passages fr a port in India to a port outside India in their wh service. The first passage is not granted until af the expiry of four years' approved service, and the after passages may be granted at intervals of not l than four years. There is a Provident Fund to whi members of the service contribute 10 per ce of their pay. The service contributes another per cent., which accumulates at interest and is repa on retirement.

Admission to the service is made by selection India and England—preference being given to th with Indian experience. Vacancies are few. Can dates in the United Kingdom should apply to t Hon. Secretary, United Kingdom Branch of t Countess of Dufferin's Fund, care of Major-Gene Sir Leonard Rogers, India Office, Whitehall, Lond Candidates in India should apply to the Chief Medi Officer, Women's Medical Service, Countess Dufferin's Fund, Simla and Delhi.

SPECIAL DIPLOMAS

DIPLOMA IN PUBLIC HEALTH.

THE following epitomises the instruction given at various universities and centres of medical education to medical men desiring to obtain diplomas in sanitary science, public health, hygiene, or State medicine, as this discipline is variously called. Resolutions, designed with a view of ensuring "the possession of a distinctively high proficiency, scientific and practical, in all the branches of study which concern the public health," have been adopted at various times by the General Medical Council. The diploma is registrable by the Council whose rules on the curriculum become binding on the educational bodies concerned. The new regulations, which came into force in 1924, extend the period of study and postpone the granting of a diploma until at least two years from qualification.

London School of Hygiene and Tropical Medicine.

The course of study for the Diploma in Public Health will commence on Sept. 29th in the premises in Keppel-street (Gower-street), the gift of the Rockefeller Foundation, which has excellent laboratories and research rooms, a fine lecture theatre and classrooms, library, and museum. The course, which will extend over a period of 12 calendar months, is arranged in compliance with the requirements of the General Medical Council, and students taking the course will be able, should they so desire, to proceed to the new academic Diploma in Public Health of London University. The curriculum has been planned on very practical lines, and includes, in addition to work with Medical Officers of Health in two selected areas, a large number of visits to places of pub health interest. A series of 5 o'clock lectures will given by eminent authorities on special subjec and these lectures will be open to members of t medical profession as well as to students of the Scho The London County Council, the City of London, a various other bodies have placed their resources at t disposal of the School for teaching purposes.

English Conjoint Board.

The regulations are as follows: The Examinat consists of two Parts. Part I. will be held in t months of January, June, and October, and Part in the months of January, June, and October in ea year. Candidates may enter for Parts I. and separately or at the same time, but they must p Part I. before proceeding to Part II. The Examinat in each part will be written, oral, and practical. Part will include a practical examination in Infecti Diseases, Food Inspection, and Inspection of selec Premises. Candidates who fail to satisfy the Examin in either part may present themselves again at t next Examination on payment of the same fe Candidates intending to present themselves for eit part of the Examination must give 14 days' notice writing to the Secretary, at the Examination H Queen-square, London, W.C.1.

Candidates will be admissible to Examination Part I. on producing evidence :—

1. Of being in possession of a registrable qualification Medicine, Surgery, and Midwifery.

2. Of having attended during a period of not less t five months at an Institution recognised by the Examin Board in England, practical instruction in (*a*) Bacteriol and Parasitology (including Medical Entomology) especi

heir relation to diseases of man and to those diseases of lower animals which are transmissible to man, during hours, of which not less than 150 hours have been upied in practical laboratory work. (*b*) Chemistry and sics in relation to public health, during 90 hours, of ch not less than 70 hours have been occupied in practical ratory work. (*c*) Meteorology and Climatology in tion to public health, during not less than 10 hours.

andidates will be admitted to Part II. of the amination on producing evidence :—

. Of having been in possession of a registrable qualification in Medicine, Surgery, and Midwifery during not less a two years, of being registered by the General Medical ncil, and of having completed the curriculum for the loma extending over a period of 12 calendar months sequent to the attainment of a registrable qualification.

Of having attended, after obtaining the registrable lification, instruction during not less than 80 hours at Institution recognised by the Examining Board in land in the following subjects :—(*a*) The Principles of lic Health and Sanitation for not less than 30 hours ; Epidemiology and Vital Statistics for not less than ours ; (*c*) Sanitary Law and Administration (including lic Medical Services) during not less than 20 hours ; Sanitary Construction and Planning during not less than ours.

Of having attended for three months the clinical practof a hospital for infectious diseases recognised by the mining Board in England and of having therein received ruction in the methods of administration. The certificate t state that the candidate has attended on one or more s in each week of the three months, that each attendance of two hours' duration, with a total attendance of ours.

. Of having been engaged during a period of not less n six months in acquiring a practical knowledge of the ies, routine and special, of public health administration er the supervision of a Medical Officer of Health, and having received, from such officer or other competent dical Officer during not less than three hours on each of working days, practical instruction in those duties and those relating to : (*a*) Maternity and Child Welfare vice ; (*b*) Health Service for children of school age, Venereal Diseases Service ; (*d*) Tuberculosis Service ; Industrial Hygiene ; (*f*) Inspection and Control of Food ; uding meat and milk.

he above certificate (4) must be obtained from a dical Officer of Health who devotes his whole time public work, or from a Medical Officer of Health a Sanitary Area having a population of not less n 50,000, or in Ireland the Medical Superintendent icer of Health of a County or County Borough ring a population of not less than 50,000.

iversity of Oxford.

he examinations for Diplomas in Public Health re been suspended until further notice.

iversity of Cambridge.

wo examinations in so much of State medicine is comprised in the functions of medical officers ealth are held during the year. The examination ivided into two parts, and demands proficiency all the branches of study which bear upon the ies of medical officers of health. The examination both parts will be oral and practical, as well as writing. Candidates may present themselves either part separately ; but the result of the mination in the case of any candidate will not be lished until he has satisfied the examiners in both ts. Marks of distinction will be placed against the nes of candidates who have specially distinguished mselves in either (1) Part I. of the examination ; (2) Part II. of the examination. Candidates must ore admission to either part of the examination duce evidence of having satisfied the regulations licable to Part I. and Part II. The examination Part I. is in April and for Part II. in October.

For Part I. of the examination courses of lectures l laboratory instruction are given in the University Hygiene, Chemistry, &c., and on Bacteriology l Parasitology. For Part II. the Medical Officer Health for Cambridge gives courses on Practical nitary Administration and in the Administrative thods of the Infectious Diseases Hospital; and the dical Officer of Health to the Cambridgeshire County Council, on Sanitary Laws, School Hygiene, Epidemiology. There are also courses by special lecturers in Vital Statistics, Tuberculosis Service, Venereal Diseases Service, Industrial Hygiene, Maternity and Child Welfare. These courses are open to non-members of the University.

A special Diploma in Hygiene is granted to medical graduates whose qualifications are not registrable in England. The courses and examinations are the same as for the Diploma in Public Health (except that the candidates are not examined in English Sanitary Laws).

All applications for further information respecting examinations and the courses of study should be addressed to Mr. Purvis, Public Health Chemical Laboratory, Cambridge.

University of London.

Candidates for the M.D. Degree may offer State Medicine as a subject in which to graduate. The regulations may be obtained on application to the Academic Registrar, University of London, South Kensington.

University of Durham.

The Degree of Bachelor of Hygiene (B.Hy.) and the Diploma in Public Health (D.P.H.).—No candidate is admitted to the final examination for the Degree of B.Hy. unless he is a Bachelor of Medicine and Surgery, of not less than two years' standing, of a recognised University whose degrees are registrable on the books of the General Medical Council of the United Kingdom, and no candidate is admitted to the final examination for the D.P.H. unless he is a registered medical practitioner, of not less than two years' standing. The course of study for the B.Hy. and D.P.H. extends over a period of not less than 12 calendar months, subsequent to the attainment of a qualification registrable by the General Medical Council of the United Kingdom. Candidates for the B.Hy. must attend this course at the University of Durham ; candidates for the D.P.H. may attend it at the University of Durham, or at any medical school or institution which is recognised by the University. The examination for the diploma or degree is divided into two parts. A candidate must pass in all the subjects of Part I. before being admitted to examination for Part II. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. The examination for Part I. is practical, written, and oral, and includes the following subjects : Bacteriology and Parasitology (including medical entomology) ; Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. Candidates are not admitted to examination for Part I. until after they have completed the prescribed courses of instruction in the subjects thereof. The examination for Part II. includes Hygiene and Sanitation (comprising sanitary construction), Epidemiology and Infectious Diseases ; Sanitary Law and Vital Statistics ; Public Health Administration. The examination is written and oral, and includes practical examinations in Infectious Diseases, Food Inspection, Inspection of Premises—Dwellings, Factories, Workshops, Schools, &c. Candidates are not admitted to examination for Part II. until after they have completed the prescribed courses of instruction in the subjects thereof. Doctor of Hygiene (D.Hy.) : Candidates must be Bachelors of Hygiene of the University of two years' standing, and are required to satisfy the examiners that they have conducted original research in the subject of Public Health.

University of Birmingham.

Under the rules and regulations of the General Medical Council the University grants a degree of B.Sc. in Public Health and also a Diploma in the same subject on the following conditions : Graduates in Medicine of this University may become candidates for the degree of Bachelor of Science in Public Health by conforming to all the requirements laid down for candidates for the Diploma in Public Health, except that after graduating in Medicine all courses

of study must be taken out in the University, and they must, in addition, have attended a three months' course of Geology in the University. A Thesis on the Ætiology and Prevention of a Disease of which the candidate has made a special study must be submitted on entry for B.Sc. Part II. The examinations will be held in the months of March and October, and will consist of two parts, each part being written, oral, and practical. No candidate will be allowed to pass Part II. until he has passed Part I. Candidates may enter for Parts I. and II. separately or at the same time. The fee for each part of the examination is £6 5*s*. Medical Officers of the Royal Navy who have attended the required course of study at the Naval Medical School, Greenwich, will be admitted to Part I. examinations for the Diploma in Public Health, whether they have previously been students at the Birmingham School or not; and the same applies to officers of the Royal Army Medical Corps who have studied at the Staff College. Medical Officers of the Navy and Army are admitted to Part II. Examination (D.P.H.) on complying with the requirements laid down for attendance upon Courses of Study. These Courses need not necessarily be attended in the University of Birmingham.

University of Liverpool.

The University grants a Degree in Hygiene (M.H.) and a Diploma (D.P.H.), and every facility is afforded for training in Sanitary Science and State Medicine. The curriculum for the Degree extends over a period of two years, the first of which is devoted to laboratory instruction and practical classes (including those for the Diploma); the second being devoted to advanced study and research. The courses may be taken at any time, and students are allowed to work daily in the laboratories.

University of Leeds.

The University grants a Diploma in Public Health, and every facility is afforded for training in Sanitary Science and State Medicine. The examination, which is held twice in each year—namely, in March and September—is in two parts, and is written, oral, and practical. Candidates must pass in Part I. before being admitted to Part II. Instruction in Entomology and Meteorology is given in the first term, and in Sanitary Chemistry and Bacteriology in the second and third terms. Practical work under arrangement with the Leeds City Council. Prospectus can be obtained from the Academic Sub-Dean of the Medical School.

University of Bristol.

Diploma in Public Health. Candidates must be at least 23 years of age, shall be fully registered medical practitioners of not less than two years' standing as such, and shall have passed the examination prescribed by regulations, which can be obtained from the Registrar upon application.

University of Wales.

Candidates for the Diploma in Public Health, the curriculum for which extends over a period of not less than twelve calendar months subsequent to the attainment of a registrable qualification, must produce evidence of having attended for not less than five months at the Welsh National School of Medicine practical instruction in Bacteriology and Parasitology, Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates must also satisfy the examiners that they have received instruction approved by the University in the Principles of Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. The candidate must also produce evidence that he has attended for three months on the clinical practice of a hospital for infectious diseases containing not less than 100 beds, and has received therein instruction in the methods of administration, and that he has for a period of not less than six months been engaged in acquiring a practical knowledge of the duties, routine and special, of a public health administration under the supervision of a medical officer of health. The examination for the diploma is divided into two parts, Part I. and Part II., each of which extends over not less than two days. A candidate must pass in all the subjects of Part I. before being admitted to Part II. of the examination. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. Part I. of the examination is practical, written and oral, and comprises Bacteriology and Parasitology (including Medical Entomology); Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates may not be admitted to Part I. of the examination until they have been certified as having pursued the prescribed courses of instruction in the subjects thereof. Part II. of the examination, which is written and oral, comprises: Hygiene and Sanitation (including Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. No candidate can be admitted to Part II. of the examination until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, Surgery, and Midwifery, which qualification must be registered before admission to Part II. of the examination. An examination in each part will be held annually. The examination in Part I. will be held in June, that in Part II. in October. Full information may be obtained from the Registrar of the University, University Registry, Cathays Park, Cardiff. Entries for the examination in Part I. must be received by him not later than May 15th, and not later than Sept. 1st for the examination in Part II.

University of Edinburgh.

Candidates for the Diploma in Public Health must be graduates in medicine and surgery of the University, or hold corresponding degrees or registrable medical qualifications which must be registered before admission to examination. The course is divided into two parts for which examinations are held twice yearly, in March and July for Part I., and in October and March for Part II. In each part the candidate must pass in all the specified subjects at one examination. Candidates are not admitted to Part II. until they have passed Part I., nor until after the lapse of not less than two years from the date of obtaining a registrable medical qualification. The subjects of the examination are: Part I. (written, oral, and practical), Bacteriology; Medical Entomology and Parasitology; Chemistry, Physics, Meteorology, and Climatology. Part II. (written, oral, and practical), Hygiene, Sanitation, and Sanitary Construction; Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. There is also included practical examinations in Infectious Diseases, Food Inspection, and Inspection of Premises. The course, which extends over a period of 12 calendar months, begins in October, and provision is made by the University for instruction in all the subjects. Detailed particulars may be obtained from the Dean of the Faculty of Medicine.

University of Aberdeen.

Every candidate for the Diploma in Public Health must be a graduate in medicine of the University of Aberdeen, or of any other University whose medical degrees are recognised as qualifying for registration by the General Medical Council of the United Kingdom. No candidate will be admitted to the Final Part of the Examination for the Diploma until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, which qualification shall have been registered before such admission. The whole of the prescribed curriculum of study must be undertaken after the candidate has obtained a registrable qualification in medicine, and shall extend over not less than twelve calendar months. At least one academic term must be spent at the University of Aberdeen. Candidates shall produce evidence of having compl

ith the following requirements in respect of study
id training:—1. Practical instruction in the follow-
g subjects within a laboratory or laboratories
pproved by the University: (*a*) Bacteriology and
arasitology (including Medical Entomology), in
lation to diseases of man and diseases of lower
imals transmissible to man—at least 180 hours, of
hich not less than 150 shall be occupied in practical
boratory work; (*b*) Chemistry and Physics, in
lation to Public Health—at least 90 hours, of which
ot less than 70 shall be occupied in practical labora-
ry work; (*c*) Meteorology and Climatology, in
lation to Public Health—at least 10 hours; such
struction to extend over not less than five months
two academic terms. 2. A course or courses of
struction extending over not less than 80 hours
aling with: (*a*) The Principles of Public Health
id Sanitation—30 hours; (*b*) Epidemiology and
ital Statistics—20 hours; (*c*) Sanitary Law and
dministration (including Public Medical Services)—
) hours; (*d*) Sanitary Construction and Planning—
) hours; such course or courses to be given at an
stitution or by a teacher or teachers approved by
ie University. 3. Practical instruction, clinical and
lministrative, within a recognised hospital for
neral infectious diseases; such instruction to
tend over three months, and to include 30 daily
tendances of not less than two hours in each week.
Practical instruction and experience, during not
ss than six months (including attendance of at
ast three hours on each of sixty working days) in
ie duties, routine and special, of public health
lministration, under the supervision of a medical
ficer of health, who shall certify that the candi-
ite has received from this officer or other com-
tent medical officer, practical instruction in these
ities, and also in those relating to: (*a*) Maternity
id Child Welfare Service; (*b*) Health Service for
hildren of School Age; (*c*) Venereal Diseases
rvice; (*d*) Tuberculosis Service; (*e*) Industrial
ygiene; (*f*) Inspection and Control of Food, in-
uding meat and milk. The medical officers of
alth recognised for this purpose by the General
edical Council are: (*a*) a medical officer of health
ho devotes his whole time to public health work;
(*b*) the medical officer of health of a sanitary area
aving a population of not less than 50,000; or
) in Ireland, the medical superintendent officer of
alth of a county or county borough having a
opulation of not less than 50,000. The examination
r the diploma is divided into two parts, each of
hich extends over not less than three days.

niversity of Glasgow.

Degree of B.Sc. in Public Health.—Candidates must
e graduates in Medicine of a University of the
nited Kingdom, or of some other University
cognised for the purpose by the University Court.
andidates must produce evidence (1) that, after they
ave obtained a registrable Degree in Medicine, a
eriod of not less than two years has elapsed; (2)
iat, after they have obtained a registrable degree in
edicine, they have, during a period of not less than
l calendar months, pursued the course of work and
struction prescribed, and have satisfied the examiners
the prescribed examinations.
There are two examinations. Part I. includes
ie following subjects: (i) Bacteriology and Parasi-
ology (including Medical Entomology); (ii) Chem-
try and Physics in relation to Public Health;
ii) Meteorology and Climatology in relation to
ublic Health; (iv) Higher Chemistry in relation to
ublic Health; (v) Physics and Geology. A candi-
ate must pass in the subjects marked (i), (ii), and
ii) of Part I. at one examination. Part II.
cludes the following subjects: (vi) Hygiene and
anitation (including Sanitary construction); (vii)
pidemiology and Infectious Diseases; (viii) Sani-
ry Law and Vital Statistics; (ix) Public Health
dministration; (x) Applied Hygiene. The exami-
ation for Part II. includes practical examinations
Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like. The examination in Applied Hygiene may be on a selected subject professed by the candidate. A candidate must pass in the subjects marked (vi), (vii), (viii), and (ix) of Part II. at one examination. *Diploma in Public Health (D.P.H.).*—Candidates for this Diploma must be legally qualified medical practitioners who are matriculated students of the University. A period of not less than two years must elapse between the attainment by the candidate of a registrable medical qualification, and his admission to the final examination (Part II.) for the Diploma. The candidate must, during a period of not less than 12 calendar months, subsequent to his attainment of a registrable medical qualification, pursue the course of work and instruction prescribed, and pass the prescribed examinations. The examination, which is both written and oral, is divided into two parts, Part I. and Part II., each of which extends over not less than two days. No candidate is admitted to either part of the examination until he has completed the prescribed courses of instruction in the subjects of that part. No candidate is admitted to Part II. until he has passed in all the subjects of Part I., nor until after the lapse of not less than two years from the date of his obtaining a registrable medical qualification, nor unless he presents a certificate showing that his name and qualification have been duly registered in the Medical Register. Part I. includes: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health. A candidate must pass in all the subjects at one examination. Part II. includes: (iv) Hygiene and Sanitation (including Sanitary Construction); (v) Epidemiology and Infectious Diseases; (vi) Sanitary Law and Vital Statistics; (vii) Public Health Administration. A candidate must pass in all the subjects at one examination. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like.

University of St. Andrews.

The Diploma in Public Health is open to those who hold a registered medical qualification of the United Kingdom. The examination is in two parts. (1) (*a*) Bacteriology and Parasitology; (*b*) Chemistry and Physics; (*c*) Meteorology and Climatology. (2) Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. Before admission to the first examination the candidate must have held his medical qualification for one year, and before admission to the second examination for two years. Graduates in Medicine of the University of St. Andrews may take part or all of the qualifying classes in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University or medical school recognised by the University Court, but holders of other registered medical qualifications must spend at least eight out of the 12 months' curriculum in St. Andrews University. A complete course is given in the Conjoint Medical School, Dundee.

Scottish Conjoint Board.

All candidates for the Diploma in Public Health must have a qualification which has been registered under the Medical Acts. The examination is divided into two parts.

For Part I. the candidate must produce evidence of having received during a period of not less than five months at an institution recognised by the Board practical instruction in: (*a*) Bacteriology and Parasitology (including Medical Entomology), especially in their relation to diseases of man and to those diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 hours have been occupied in practical

laboratory work; (*b*) Chemistry and Physics in relation to Public Health during 90 hours, of which not less than 70 hours has been occupied in practical laboratory work; (*c*) Meteorology and Climatology in relation to Public Health during not less than 10 hours. For Part II. evidence must be given of having received instruction during not less than 80 hours in: (*a*) The Principles of Public Health and Sanitation for not less than 30 hours; (*b*) Epidemiology and Vital Statistics for not less than 20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services) during not less than 20 hours; (*d*) Sanitary Construction and Planning during not less than 10 hours; of having attended for three months the clinical practice of a recognised hospital for infectious diseases; and of having been engaged during a period of not less than six months in acquiring a knowledge of Public Health administration in addition to practical instruction in the duties relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for Children of School Age; (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food, including meat and milk. The fee is 12 guineas for both examinations, or 6 guineas for either of them. A fee of 6 guineas is payable by rejected candidates for either examination. The examination is held twice yearly, in March in Glasgow, and October in Edinburgh. The published regulations provide detailed synopses of the subjects of examination. The Registrar for Edinburgh is Mr. David Thomson, 49, George-square, and for Glasgow, Mr. Walter Hurst, 242, St. Vincent-street.

University of Dublin (Trinity College).

The Diploma in Public Health is conferred, after examination, under the following conditions. The candidate must be a registered medical practitioner and have obtained a registrable qualification at least two years before the second part of the examination. The candidate must have completed, subsequently to obtaining a registrable qualification, five months' practical instruction in a chemical and bacteriological laboratory, or laboratories, approved by the University, must have received instruction in the following subjects: the principles of public health and sanitation, epidemiology and vital statistics, sanitary law and administration (including public medical services), sanitary construction and planning; must have studied, practically, outdoor sanitary work for six months under an approved officer of health, and must have attended for three months at a fever hospital where opportunities are afforded for the study of methods of administration. The De Renzy Centenary Prize, value about £15, is awarded to the candidate who obtains the highest marks at the June examination each year, provided sufficient merit is shown. A special prospectus may be obtained by application to the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland.

At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health.

University of Belfast.

A Diploma in Public Health is given by examination. Every candidate must produce evidence that, after obtaining a registrable qualification, he has during six months received practical instruction in an approved laboratory in which Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man are taught. After obtaining a registrable qualification every candidate must produce evidence that he has attended during three months the practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. The examination must have extended over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical examination in, and reporting on, subjects which fall within the special outdoor duties of a medical officer of healt The first part of the examination will have referen to the general principles of Sanitary Science, and t second part to State Medicine and to the applicatio of Pathology and Sanitary Science. The examinati in both parts is held twice a year, in March and Jun

Irish Conjoint Board.

Every candidate for the Diploma in Public Heal must observe the following rules: 1. A period of n less than two years shall elapse between t attainment by a candidate of a registrable qualific tion in Medicine, Surgery, and Midwifery, and h admission to the Final Examination for a Diplon in Public Health. 2. The curriculum for a Diplon in Public Health shall extend over a period not less than 12 calendar months subsequent the attainment of a registrable qualificatio 3. Every candidate shall produce evidence having attended, during a period of not less th five months, at an institution approved by t Licensing Body granting the Diploma, practic instruction in—(*a*) Bacteriology and Parasitolo (including Medical Entomology), especially in th relation to diseases of man, and to those diseases the lower animals which are transmissible to ma (*b*) Chemistry and Physics in relation to Pub Health; (*c*) Meteorology and Climatology in relati to Public Health. At least 180 hours must be devot to Course (*a*), of which not less than 150 hours sh be occupied in practical Laboratory work. At lea 90 hours must be devoted to Course (*b*), of which n less than 70 hours shall be occupied in practic Laboratory work. At least 10 hours must be devot to Course (*c*). 4. Evidence of having received, duri not less than 80 hours, at an institution or fro teachers approved by the Licensing Body granti the Diploma, instruction in the following subject (*a*) The Principles of Public Health and Sanitatio (*b*) Epidemiology and Vital Statistics; (*c*) Sanita Law and Administration (including Public Medi Services); (*d*) Sanitary Construction and Plannir 5. Evidence that he has attended for three mont on the clinical practice of a recognised Hospital f Infectious Diseases. 6. Evidence that he has, during period of not less than six months, been engaged acquiring a practical knowledge of the duties, routi and special, of Public Health Administration und the supervision of a Medical Officer of Healt The examination for the Diploma is divided into t parts. The examination for Part I. includes Bacter logy and Parasitology (with Medical Entomology Chemistry and Physics, and Meteorology and Clim tology, in relation to Public Health. The examir tion for Part II. includes Hygiene and Sanitati (with Sanitary Construction); Epidemiology a Infectious Diseases; Sanitary Law and Vit Statistics; Public Health Administration. The exa ination, which is written and oral, includ practical examinations in Infectious Diseases; Fo Inspection; Inspection of Premises—dwellings, fa tories, workshops, and schools.

DIPLOMA IN TROPICAL MEDICINE.

Although a qualification in tropical medicine h not been made registrable by statute, a diploma regarded as indispensable for appointments in t Colonial Medical Service and similar positions abro Systematic instruction for these diplomas is given the Incorporated Liverpool School of Tropical Medici (founded in 1898) and at the London School Hygiene and Tropical Medicine, Keppel-street, Gow street, London, W.C.; while the Universities Cambridge, Edinburgh, and the English Conjoi Board grant the diploma.

London School of Hygiene and Tropical Medicine.

There are two courses of study in Tropical Medici and Hygiene in the year, each lasting 20 weel inclusive of examinations. The dates for t commencement of the next courses are Sept. 30

0, and Feb. 2nd, 1931. The course covers the k required for the D.T.M. & H. (England), and t of that required for the M.D. in Tropical Medicine the University of London.

iversity of Liverpool.

The University grants a Diploma in Tropical dicine. At the end of each full course an examina- is held by the University for its Diploma of pical Medicine (D.T.M.), which is open only to those o have been through the course of instruction of school. The subjects of examination are (*a*) asitology and Tropical Pathology. (*b*) Entomo- y. (*c*) Tropical Medicine, including Ætiology, nptoms, Diagnosis and Treatment of Tropical eases. The advanced course consists entirely Practical and Clinical Laboratory Work, given the Laboratory at the University. Applications uld be made to the Dean of the Medical Faculty, iversity of Liverpool.

The University also grants a diploma in Tropical giene (D.T.H.). The subjects of examination are Tropical Hygiene (including Sanitary Engineering, al Statistics and Epidemiology and Applied asitology and Entomology). (*b*) Practical Sanita- n. (*c*) Bacteriology. (*d*) Chemistry (including eorology and Climatology). Two University lowships of £100 a year each are open to students the school, amongst others. Accommodation research work is to be had at the University oratory. The Mary Kingsley Medal is awarded the school for distinguished work in connexion h Tropical Medicine.

iversity of Cambridge.

The examination for the Diploma in Tropical dicine and Hygiene is divided into two parts. t I. is held in Cambridge in April and Part II. uly in London. Candidates for Part I. are exam- d under the same regulations and in the same jects as candidates for the Diploma in Public alth, but any qualification in medicine or surgery gnised by the proper authority of any country side the British Dominions may be recognised. subjects for Part II. are Medicine, Surgery, and giene in their relation to Tropical Disease.

The examination will be partly in writing, partly al, and partly practical or clinical (the clinical t will be conducted at a hospital for tropical eases, at which cases will be submitted for diagnosis l comment). Every candidate who passes the mination to the satisfaction of the examiners will ive from the University a diploma (D.T.M. & H.) ifying to his knowledge and skill in tropical dicine and hygiene.

Further information respecting the courses of dy and examinations may be obtained from Mr. E. Purvis, Public Health Chemical Laboratory, nbridge.

iversity of Edinburgh.

Candidates for the Diploma in Tropical Medicine Hygiene must be graduates in medicine and gery of the University of Edinburgh or hold responding registrable degrees or qualifications of e other licensing body. The course of instruction, prising a primary and a second course, is given ing the autumn and spring terms, October to ch, and includes Tropical Hygiene, Bacteriology, omology and Parasitology, Diseases of Tropical nates (systematic and clinical), Tuberculosis, and ereal Diseases. The primary course alone is also en during the summer term, April to June. Pro- on is made in the University for instruction in all jects.

The examinations are written, oral and practical, are held at the end of the courses. Candidates required on the first occasion of presenting mselves for examination to appear for all the jects. Candidates who fail to pass the entire mination within a period of 12 months after first earance are required to reappear for all the subjects. The University is included in the list of Institutions whose courses of instruction in Tropical Medicine may be taken by officers on appointment to the Colonial Medical Services or during study-leave. Full particulars can be obtained from the Dean of the Faculty of Medicine.

English Conjoint Board.

The diploma of D.T.M. and H. Eng. is awarded on the results of an examination held twice yearly, in March and July. Candidates must possess a registrable qualification, and produce evidence of having attended (1) practical instruction in pathology, protozoology, helminthology, entomology, bacteriology, and hygiene in relation to tropical medicine in a recognised institution during not less than five months; (2) clinical practice of a recognised hospital for the same period. Conditions of study may be modified in the case of candidates of special experience. Further particulars from the Secretary, Examination Hall, Queen-square, London, W.C.1.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

The Universities of Cambridge, London, Durham, Leeds, Manchester, Edinburgh, Dublin, National University of Ireland, and the Conjoint Board of the R.C.P. Lond. and R.C.S.Eng. now grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses; the details on these points can be obtained from the various examination bodies.

In London, courses of instruction for the Diploma in Psychological Medicine are given annually at the Maudsley Hospital, Denmark Hill, which has recently been definitely recognised as a school of the University of London. The course consists of two parts, commencing in January, and is adapted for the diploma of the Conjoint Board, the University of London, or the University of Cambridge. The parts may be taken separately; also during the year there are other short courses, lectures and demonstrations in psychological medicine.

Maudsley Hospital.

Appointments as clinical assistants are obtainable at the Maudsley Hospital. The holding of such appointments for varying periods satisfies the requirements of the different examining bodies in respect of practical study of mental disorders. The appointments and other facilities for clinical experience are open to qualified medical practitioners apart from the courses of instruction. Inquiries as to lectures should be addressed to the Director of the Central Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E.; and as to clinical facilities, to the Medical Superintendent at the same address.

Bethlem Royal Hospital.

A course of lectures and practical instruction for the Diploma in Psychological Medicine, granted by the various universities and the Conjoint Board, is held at Bethlem Royal Hospital, Monk's Orchard, Eden Park, Beckenham, twice annually, during the spring and autumn. The fee for the full course is 15 guineas. Part A or Part B, however, may be taken separately at a fee of 10 guineas per part. In addition to the above, clinical instruction in Psychological Medicine is given at Bethlem Royal Hospital every morning (except Wednesdays) at 11 A.M. The fee for students is 3 guineas for a period of three months' attendance and for post-graduates a fee of 5 guineas for a like period. A reduction is made to those who attend the Diploma Course. House physicians are appointed at Bethlem Royal Hospital for a term of six months, which may be extended. These appointments are made on May 1st and Nov. 1st in each year, and the vacancies are

advertised in the medical papers. Apartments, complete board, attendance, and laundry are provided and also a salary at the rate of £100 per annum. Clinical assistants are often appointed from time to time for periods of three months or longer. These are non-salaried and non-resident posts, but partial board is provided. The Physician-Superintendent, Bethlem Royal Hospital, Monk's Orchard, Eden Park, Beckenham, will supply further particulars.

University of Edinburgh.

Candidates for the Diploma in Psychiatry must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications of some other licensing body. Candidates are required subsequent to the date of graduation or obtaining a registrable qualification to have held (*a*) a resident appointment for one year in a hospital for mental disorders approved by the Faculty of Medicine, or alternatively (*b*) a six months' appointment as defined in (*a*) and six months' practical study of nervous diseases in a special or general hospital approved by the Faculty of Medicine. There are two examinations for the Diploma. Part I. comprises: 1. Anatomy of the Nervous System. 2. Physiology of the Nervous System. 3. Psychology and Experimental Psychology. Part II. comprises: 1. Neuropathology. 2. Clinical Psychiatry. 3. Clinical Neurology. 4. An additional subject selected by the candidate from a prescribed list. The examinations are held twice yearly in March and July. Candidates who have held an asylum appointment for a period of five years or more may be exempted from the course of study in one or more subjects of the curriculum. Full particulars can be obtained from the Dean of the Faculty of Medicine.

Dublin University.

A post-graduate diploma in Psychological Medicine is conferred upon registered medical practitioners who have held a resident medical appointment at a recognised institution for the treatment of Mental Diseases for 12 months, or who have held such an appointment for six months and have attended clinical instruction at an approved institution for six months. Candidates must also attend special courses of instruction and pass a special examination. Details can be obtained from the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland.

This university confers a diploma in Psychological Medicine; application should be made to the Registrars of the Constituent Colleges, University College, Dublin University College, Cork, and University College, Galway, for all information.

DIPLOMA IN OPHTHALMIC MEDICINE.

Special diplomas in ophthalmic medicine and surgery are issued by two examining bodies.

University of Oxford.

The diploma in ophthalmology (D.O) is granted to registered medical practitioners after passing an examination, held annually in June, which is open to candidates who have pursued at Oxford a course of study in ophthalmology over a period of at least two months and who have attended a 12 months' recognised hospital course. Further information regarding these requirements may be obtained from the Dean of the School of Medicine.

English Conjoint Board.

The Conjoint Board grants the D.O.M.S. after an examination held in two parts, twice yearly in February and July. Part I. comprises anatomy and embryology of the visual apparatus, physiology of vision, and elementary optics. Part II. comprises optical defects, ophthalmic medicine and surgery and pathology with special reference to ophthalmolog The examination in each case is written, oral, a practical or clinical. Candidates may only enter Part II. on completion of a year of special study ophthalmology after obtaining a registrable diplor or a Degree in Medicine and Surgery of a Universi recognised by the Board.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

University of Cambridge.

The D.M.R.E. is open only to those who ha held for at least one year a medical qualificati approved by the Committee. The new regulatio which came into operation in October, 1928, in sor respects materially alter the scope of the Diplon The course now occupies nine months, beginni in October. The first three months, which can spent either in Cambridge or in London, are occupi with lectures and practical work in Physics in prepa tion for the examination for Part I. in Januai and an introductory course in Radiology and Elect logy. The second three months must be spent London. The course includes lectures and clinic instruction in Radiology and Electrology, wi clinical practice in the radiological departme of a hospital approved for that purpose by t Committee. The examination for Part II. is he in April. During the final three months a candida must hold a clinical clerkship or similar appointme in a radiological department approved by the Co mittee, and must then present an exercise in t form of a critical report with notes upon six ca either in Radiology or in Electrology or in both the subjects, illustrating various methods of diagnos or treatment. Under certain circumstances previous experience, the third three months may excused, but the standard of the exercise or thesis expected to be considerably higher. A number large provincial hospitals have been approved by t Commitee to take clinical assistants for this part the course.

Further particulars as to courses and examinatio may be obtained from G. Stead, M.A., Cavendi Laboratory, Cambridge, Secretary for the Diplon or from Dr. A. E. Barclay, Department of Radiolog Medical School, Cambridge, or from Dr. Stanl Melville, British Institute of Radiology, 32, Welbec street, London, W. 1.

University of Liverpool.

Candidates before admission to the examinati for this diploma must possess a registrable qualificati approved by the University in medicine and surge and must have attended courses of instruction (*a*) physics (two terms), (*b*) (i.) radiology, and electrology during six months in the X ray a electrotherapeutic department of a hospital hospitals. An examination is held in March ea year, the subjects being (*a*) physics, (*b*) radiology a electrology. Examination in either part may taken separately. These courses commence duri the first week in October. Application should made to the Dean, Faculty of Medicine, the Universi of Liverpool.

University of Edinburgh.

Candidates for the Diploma in Radiology (D. Univ. Edin.) must be graduates in medicine a surgery of the University of Edinburgh or hc corresponding registrable degrees or qualification fr some other licensing body. Candidates are n admitted to the examination for the Diploma un after the lapse of not less than one year from obtaini a registrable qualification, which qualification mu be registered before admission to the Examinatio The course of study begins in October and extends ov a period of not less than three terms. The Examir tion, which is written, oral, and practical, is in t

arts: (*a*) Physics, and (*b*) Radiology. The Examination is held twice yearly—viz., July and October. Radiology can be taken as the special subject in the examination for Membership of the Royal College of Physicians of Edinburgh, which means that an Honours standard has to be attained. Full particulars may be obtained from the Dean of the Faculty of Medicine.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.

English Conjoint Board.

The Board grants the D.L.O. after an examination held in two parts, in June and December. Part I. comprises anatomy, embryology, and physiology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus. Part II. comprises the medicine, surgery, and pathology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus, and the recognition and use of special instruments and appliances. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of one year of special study of the diseases of the ear, nose, pharynx, and larynx, after obtaining a registrable qualification, or a degree in medicine and surgery of a University recognised by the Board. The fee for admission to each part is 6 guineas.

DIPLOMA IN TUBERCULOUS DISEASES.

University of Wales.

The regulations governing the award of the Diploma of T.D.D. prescribe that every candidate must have obtained a registrable qualification in Medicine, Surgery, and Midwifery for at least two years before he can be admitted to the examination. He must have held, for not less than 12 months, a resident medical or surgical appointment on the staff of a Tuberculosis Hospital or Sanatorium, or at an Orthopædic Institution providing not less than one hundred beds for cases of surgical tuberculosis; or shall satisfy the Faculty of Medicine that he has pursued a special study of Tuberculosis equivalent to the above for a period of not less than 12 months. Every candidate must have pursued a course of instruction in the epidemiology, pathology, and bacteriology of tuberculosis extending over one term in the Welsh National School of Medicine, or an equivalent course of instruction extending over at least the same period in an institution approved by the University for this purpose. The examination is held annually in the first week of June. Notice of candidature, together with the entrance fee of £10 10*s*., and the necessary certificates, must be forwarded to the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 1st.

The *Cecil Prosser Research Scholarship*, of the value of £250 for one year, is awarded triennially for research in Tuberculosis.

DIPLOMA IN BACTERIOLOGY.

University of London.

The University of London grants an Academic Diploma in Bacteriology, the Course being open to (*a*) Graduates in Medicine, Science and Pharmacy of this or another approved University, whose previous training has, in the opinion of the University, fitted them to profit by the Course; and (*b*) registered medical practitioners and other students who, though not graduates, have obtained a qualification and undergone a previous training which, in the opinion of the University, has fitted them to profit by the Course.

A Course necessary to fufil the regulations of this Diploma has been planned by the London School of Hygiene and Tropical Medicine, Keppel-street, London, W.C., and full particulars with regard to the Diploma may be obtained from the Academic Registrar, University of London, South Kensington, S.W.

DENTAL SURGERY

TEACHING INSTITUTIONS IN DENTISTRY.

REGISTRATION on the Medical Register entitles a practitioner to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but few dental appointments at general or special hospitals or dispensaries are available save to those with a special diploma, and, until registered on the Dentist Register, no dental work under the Additional Benefit Scheme of the National Health Insurance Act can be undertaken.

The Examining Bodies in Dentistry which grant degrees and diplomas in the subject are as follows: Royal College of Surgeons of England, Royal College of Surgeons, Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow, Royal College of Surgeons in Ireland, and the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Manchester, Sheffield, St. Andrews, Dublin (Trinity College), Queen's University of Belfast, and the National University of Ireland. The student should apply to the secretaries of the various Conjoint Boards or to the Deans of the medical faculties or medical schools for a syllabus.

TEACHING INSTITUTIONS IN LONDON.

Royal Dental Hospital.

The Royal Dental Hospital of London, School of Dental Surgery, Leicester-square, is a school of the University of London. Women are admitted as students and are eligible for all hospital appointments and school prizes. The school provides the special dental education required by the University of London for the B.D.S. Degree and the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 5 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The instructors at the commencement of each session give a course of lectures on Operative Dental Surgery. The five house surgeoncies are held for four months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £25. One Entrance Scholarship in Dental Mechanics and Metallurgy, value £25. For full information as to scholarships and prizes, and other matters connected with the course, application should be made to the Dean.

University College Hospital Dental School.

This Hospital and School, situated at the corner of Great Portland and Devonshire-streets, W., has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Anatomy

and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the *National Dental Hospital*, the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. A prospectus containing full information as to lectures, fees, and prizes may be had on application to the Sub-Dean for Dental Students, who attends at University College Hospital Medical School, University-street, W.C.1, on Wednesday mornings from 9.30 to 10.30, and at other times by appointment.

Guy's Hospital Dental School.

The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: There is ample accommodation for both general and local anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrators, the dental house surgeons, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M. It affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. There is a separate room for denture patients affording accommodation for 15 chairs and a separate department for children with accommodation for 20 chairs. The Members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by three of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by three demonstrators, a house surgeon, and seven mechanics.

Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. Students who enter for a medical as well as a dental course are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge.

Twelve house surgeons, 20 assistant house surgeons, and four student demonstrators of Dental Histology are appointed annually. The following appointments are held by students: Full surgeon's dresser, assistant surgeon's dresser, dresser in the children's department, casualty dresser, clerk to the anæsthetist, dresser in the gas extraction and local anæsthetic extraction rooms, and probationary dresser. For particulars as to scholarships and prizes, as well as all information, application should be made to the Dean of the Medical School, Guy's Hospital, London Bridge, S.E. 1.

King's College Hospital.

The Dental School is part of the Medical School of King's College Hospital, and was opened in November, 1923. The Dental Out-Patient Department of the Hospital is used for the performance of dental extractions. A large Conservation Room with provision for 40 dental chairs has been equipped. Smaller rooms are used for clinical teaching and administrative requirements, and a specially equipped laboratory for training in the art of dental mechanics. An X ray apparatus has been installed for special use in dental skiagraphy. A museum containing a lar number of specimens illustrating oral, buccal, dent and other diseases is available for teaching purpos The library, lecture theatre, lecture rooms, comm rooms, and the refreshment room are all availab for the use of students. Courses of study, includi practical work, are provided for the degree of Bachel of Dental Surgery of the University of London, a for the Diploma in Dental Surgery of the Roy College of Surgeons of England. Special arrangemen are made for those students who wish to take medical degree or qualification in addition to a degr or diploma in Dental Surgery.

The following salaried appointments are open qualified members of the School: Registrar, Reside House Surgeon, Non-Resident House Surgeon, a Tutors in Dental Mechanics, Orthodontics, a Dental Materia Medica.

Full particulars of the Dental School may obtained on application to the Dean, or to t Secretary of the Medical School, King's Colle Hospital, Denmark Hill, London, S.E. 5.

London Hospital.

This school is a part of the London Hospital a Medical College, and is fully equipped on the mo modern lines and with the latest appliances. provides a complete curriculum in all subjects f the B.D.S. Degree and for the L.D.S. Diploma, a is admirably adapted for the purpose of teachin The Conservation Room is well lighted a ventilated and fitted with pump chairs of t latest pattern; the fountain spittoons at many the chairs have been specially designed. Ea spittoon has attached to it a saliva ejector, hot a cold water, compressed air, gas and electric curre also a swing bracket to carry the students' cabine Electric sterilisers are supplied in each departme and motor engines where required. The Scho possesses, in addition to the Theatres, Laboratorie and Museums in the College, a special Museum Dental Anatomy and Surgery, Operative Dentistr Prosthetic and Extraction Rooms, and Laboratori for Practical Metallurgy and Prosthesis. A systemat course of instruction is arranged for pupils. The up-t date Laboratory contains every modern apparat and is in charge of a skilled curator and his assistant Entrance Scholarship: Francis Farmer Scholarsh in Science, value £25; no age limit. Subject Chemistry and Physics. Prizes: The Harold Fi Prize in Operative Dental Surgery, value £8 8s the "London" Prize in Dental Prosthesis, val £5 5s. Prizes are also offered for competition at t end of each of the courses of lectures in the curriculu Connected with the Medical College and Dental Scho are a Library, Athenæum, Clubs' Union, Dining H with moderate tariff, Students' Hostel, and an Athlet Ground. For full particulars as to Scholarships a Prizes, fees and course of study advised, apply to t Dean of the Medical School.

Royal Free Hospital: London School of Medici for Women.

Full courses are arranged for women students f the study of dentistry and in preparation for t B.D.S. Degree of the University of London and t Licence in Dental Surgery of the Royal College Surgeons of England, at the London (Royal Fr Hospital) School of Medicine for Women. T Eastman Dental Clinic will, when completed, provi a Dental School for women students; in the meantin the course for dental students is arranged in co junction with the Royal Dental Hospital.

TEACHING INSTITUTIONS OUTSIDE LONDON.

Birmingham Dental Hospital.

Dean: Cyril Howkins, C.B.E., D.S.O., M.R.C.S L.D.S. The Dental Hospital, Great Charles-stree has accommodation for 100 students. The equi ment is in accordance with the most modern requir ments for the efficient teaching and practice of Dent Surgery, including Radiology and Ultra-Violet Ra Therapy and a new department for Practical Patholo

d Bacteriology. The operations performed nually average 35,000, including gold and other tings, crowns, bridges, porcelain inlays, and injections c block and infiltration anæsthesia. The orthontic department is one of the foremost in the untry. The Prosthetic and Mechanical Departent is large and well lighted and under a highly illed instructor who is always present. Applicaon for information as to fees and scholarships must sent to the Dean of the Medical Faculty, Birmingm University, or the Dean of the Dental Hospital, rmingham.

eds University School of Dentistry.

The School of Dentistry is adequately equipped to ovide for the complete training of the dental student. forms a part of the Leeds School of Medicine whilst e instruction in clinical and mechanical dentistry is rried out in the Dental Hospital. The School is w in occupation of a spacious new building pecially designed to the requirements of modern ntal teaching. The School is also the dental partment of the General Infirmary, and its close sociation with the work of that institution ensures adequate supply of clinical material, and enables fuller insight into the position dental surgery lds in relation to general medicine and surgery, pecially with regard to the major diseases and juries of the head and neck. The courses of study e mainly designed to meet the requirements of the Ch.D. and L.D.S. Leeds, but every opportunity is orded to students preparing for the degrees or plomas of other licensing bodies. Full-time demonrators give the instruction in clinical dental surgery, osthetic dentistry, and mechanics, which is carried t under the supervision and direction of members of e Honorary Staff, two of whom are in attendance ch day. Special facilities are provided for instruction Orthodontia, Dental Radiography, Local and neral Anæsthetics. Prizes are offered for competion to pupils and students in their respective years study. Communications should be addressed to e Warden, School of Dentistry, Leeds, from whom prospectus may be obtained.

ntal Hospital of Manchester.

This hospital is in association for teaching purposes th the University of Manchester and the Royal firmary, and is in the centre of a very large popula-on. Courses of study are provided to met the quirements of the various examining bodies, cluding those of the University of Manchester for e qualifications L.D.S. and B.D.S., and the L.D.S. the Royal College of Surgeons of England. Clinical struction is given in Dental Prosthetics, Operative ntistry, Diagnosis and Extraction, Orthodontics, ental Surgery, Radiography, and Anæsthetics by ecially appointed Clinical Teachers.

All the courses of instruction are open to women udents. Copies of the Prospectus will be forwarded application to Mr. J. Hilditch Mathews, Dean.

ewcastle-upon-Tyne Dental Hospital and School.

This hospital is centrally situated (within 5 minutes the various colleges, infirmary, and railway station); e rooms are well lighted and thoroughly equipped r carrying on the work. Dental surgeons and an æsthetist attend each morning. A tutorial dental rgeon is also in attendance. Medals and Certiates of Merit are granted to students showing rtain standards of proficiency in the various classes the Dental School. The prospectus of the Dental ospital and School, containing full information, ay be obtained from Mr. James Coltman, 13, llison-place, Newcastle-upon-Tyne, Dean.

evon and Exeter Dental Hospital.

The hospital at 24, Southernhay West, Exeter, is en on Mondays, Tuesdays, Wednesdays, Thursdays, ridays, and Saturdays, and patients are admitted tween the hours of 9.30 and 11 A.M. Students tend the practice of the hospital under the control the medical officers.

SCOTTISH TEACHING INSTITUTIONS.

Edinburgh Dental Hospital and School.

The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street, and offers special advantages to dental students. A large and important extension of the existing buildings has now been opened. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Assistant Secretary.

Incorporated Glasgow Dental Hospital.

This hospital is located at 158, Renfrew-street, and 15, Dalhousie-street, Glasgow. The school is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, Radiology, Anæsthetics, and Dental Materia Medica. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extramural schools where special provision is made for Dental Students. A new mechanical laboratory with bench accommodation for 60 pupils and fully equipped with the most modern appliances for teaching practical dental mechanics has recently been added. Full information may be had on application to the Dean.

Glasgow Royal Infirmary.

Dental Department: The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry, three months; Surgery, six months; Medicine, six months; Materia Medica, three months; Dental Surgery, six months, and attendance for two years on the dental department of the hospital. Clinical Medicine (three months) and Clinical Surgery (six months) are taken at the Royal Infirmary.

IRELAND.

Dental Hospital of Ireland.

All Dental Students who have passed their Second Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica, and instruction in Anæsthetics. The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean, at Lincoln-place, Dublin.

AN ADDRESS

MEDICINE IN CANADA.*

By W. Harvey Smith, M.D., C.M. McGill,
PROFESSOR OF OPHTHALMOLOGY AT THE MANITOBA MEDICAL COLLEGE AND OPHTHALMOLOGIST TO THE WINNIPEG GENERAL HOSPITAL.

[After welcoming visitors from the Mother Country and expressing warm appreciation of the proposal to provide in London a great post-graduate centre for the teaching and practice of medicine, Prof. Harvey Smith continued :—]

At no period in our history has medicine stood higher in public esteem and confidence than to-day, and never has our profession enjoyed a greater measure of goodwill and public support than at the present time. Admittedly, however, certain phases of practice are open to criticism, and the Æsculapian guild is confronted with many problems pressing for solution. These relate mainly to costs, unavailability of medical aid, and lack of qualification.

State Medicine Impending in the West.

The ground-swell of dissatisfaction is felt especially in the west. In British Columbia, for example, the medical profession frankly admits that State medicine is impending, and plans for dealing with the situation, when it arises, on a basis that will be satisfactory both to the patient and the public. The trend towards State medicine at the coast is indicated by the report of the Royal Commission on State Health Insurance and Maternity Benefits—whose membership of five includes two physicians—recently submitted to the legislature, setting forth the results of an exhaustive study of health insurance which, while not complete, has progressed sufficiently to warrant the following conclusions :—

> Our investigations so far convince us that there is justification, and a general demand for the introduction in British Columbia, of an economically sound and equitable public health insurance plan, in the interests of the majority of provincial workers, of provincial industries, and of the State, in the more effective safeguarding and preservation of communal health, the more rational distribution of sickness costs, and the scientific reduction of such charges to the Government, to employers, and to individual citizens.

A TRAVELLING CLINIC.

In Alberta the tendency of the times is shown by a novel departure from accepted precedent, which has been sanctioned and established by the Government, and in the main approved by the medical profession. It has taken the form of a travelling clinic. The fear, so widely expressed by many physicians, that such a system will lead to State medicine is combated by the director of the clinic, who maintains that it will have the reverse effect, and that, by reaching the children in the rural communities, the principle of periodic health examinations will be carried to the parents. "Undoubtedly," he says, "the actual examinations and treatments given in the past have been of great benefit to these people, who cannot arrange to have examinations done and operations performed, if the service is not taken to them." While differences of opinion may exist as to the value of this travelling clinic as a manifestation of public policy in the domain of medicine, it has great significance.

In Saskatchewan certain developments of a ver radical character have taken place under Governmer auspices, and are being studied with interest by a who are concerned with medical practice an economics. These include the establishment of unio hospitals under the control of adjoining municipaliti which are supported through taxation and provid service at an extremely low rate, the employment physicians by the municipality on a salaried basi the provision of free nursing care for stated period and the assumption of financial responsibility by th province for the treatment of all tuberculous person

Cost of Medical Care.

Innumerable other examples of the prevailin trend in Canada could be cited from the Provinc of Quebec westward to the Pacific. In this connexio I may say that both the Canadian Medical Associatio and the Department of Pensions and Nation Health at Ottawa are making a study of medical ca and its cost, with a view to submitting constructiv recommendations at a later date. The monument task undertaken by our friends in the United State of embarking upon a five-year programme of invest gation into the cost of medical care is further eviden of the increasing importance of attempting to de constructively with this problem.

When under legislative authority a licence practise is granted, it simply indicates that th individual to whom it is issued has, at least, th minimum qualifications of a general practitioner. does not certify, however, that he possesses speci knowledge in any of the many divisions of medicin He may be a man of the highest character and ideal willing to place the welfare of his patient first, and avoid operations and procedures which he has neith the capacity nor the experience to perform. This true of the majority of practitioners. On the oth hand, he may be of a type, not unknown, th pretends to knowledge not possessed and qualificatio non-existent.

QUALIFICATION OF SPECIALISTS.

I need not emphasise the value to the communit of medical skill as a factor in shortening periods disability and reducing medical costs, but I wou like to stress the urgent need of securing, in Canad at least, such amendments to the different provinci medical Acts as would enable the governing bodi of our profession to pass upon the qualifications men purporting to be specialists. The Governmer has upon its statute books laws relating to th standardisation of weights and measures and ensure the purity and quality of products offered f sale. Surely it is more important that the medic skill available for the use of humanity should b approximately as represented.

Of recent legislation in Canada dealing with medic practice, that which stands out pre-eminently in i claim to attention is the statutory regulation specialism in the Province of Alberta, which is th most advanced legal enactment of its kind in th country. It provides that no practitioner can ho himself out to the public to be a specialist in ar recognised field of special practice unless he h received from the Senate of the University of th province a certificate that he has complied with certa specific requirements as to study and experienc Under this arrangement, bona fide specialists and th

* Abstract of the Presidential Address delivered at Winnipeg on August 26th, at the opening of the ninety-eighth annual meeting of the British Medical Association.

ublic of Alberta are being protected against unin-ructed, unskilled, and unqualified persons announc-ig themselves as specialists. The Alberta legislation unquestionably in the direction of a higher standard f education and competency in specialised and ideed in general practice as well. I feel justified in aying that it will be but a matter of time until the ther provinces follow the excellent lead thus given.

PROVISION OF SKILLED NURSING.

The nurse, as a major factor in the increasing cost f medical care, occupies an important position, and riticism of her and of the organisations which are sponsible for the educational and economic policies nder which she labours is free and insistent. It ay be that the nursing profession has failed to rovide semi-skilled, as well as skilled, service, and to evelop organisations and policies to meet every ype of technical and economic nursing requirement. ut careful surveys covering a wide field show that he professional nurse may justly voice a claim for ore consideration than she has received. She is mployed less than 60 per cent. of her time, earns r less than a skilled workman, and quite justly is issatisfied with her present status and her future rospects. Is there not some plan which could be dopted under which she may be freed from economic nxiety, and may satisfy the requirements of the ublic and the medical profession in the matter of ost and skill? I believe there is. We have in anada a national organisation (established under oyal charter) known as the Victorian Order of Nurses, hich was founded in 1897, at the time of Queen ictoria's Jubilee, by the Countess of Aberdeen.

This Order is represented in practically all the rger centres of population, and has established and aintains a visiting nursing service. It engages and irects the activities of its staffs of nurses, in the are of the sick, the demonstration of nursing methods, nd the prevention of disease, and offers at a reason-ble price a supervised service, on an hourly or daily asis, of every type, from that supplied by the highly rained registered nurse to the humble ministrations f the home helper. The members of its staff are arefully selected, and must submit to a period of hree months' probation. They are continuously mployed, and are allotted duties upon a basis of pecial aptitude and fitness. The national scope nd character of the organisation, the type and apacity of those who direct its activities, its wide eographical distribution and uniform policy and ethods, and its very close association with the edical profession of Canada make it fitting that his body should undertake to solve, in part at least, he problem of nursing cost and service. This would nvolve some realignment of its policies and prin-iples of management, and recognition on the part f the Order and of the medical profession of Canada f the possibility of securing all necessary nursing ervices at a minimum cost, that might result from he extension of the activities of the Order to meet he requirements of rural and urban nursing.

FINANCIAL TRAGEDY OF SICKNESS.

The fundamental considerations involved in medical ervice are cost and purchasing power. The particular ifficulty that confronts patients is that sickness or ccident are unforeseen, unanticipated, and usually nprovided for. Consequently, when the scourge of lness come to the home, the patient is seldom pre-ared to meet the financial obligations involved. Vhen it is realised that the annual incomes of 0 per cent. of the families in the United States (and this doubtless applies to Canada) is below $2000 a year, one can understand why the problem of sickness so often assumes the proportions of a financial tragedy.

It has been computed that 30 per cent. of patients are attended without charge by the medical profession, while a further 20 per cent. are treated at reduced rates. Hitherto the practitioner has cheerfully borne his burden, but the increasing cost of medical education and the greater demands that the practice of medicine makes to-day upon his time and energy, is causing restlessness and dissatisfaction that is freely voiced. The taxpayer not unnaturally views with complacency the operation of a system that relieves him of a vast financial responsibility, but it is becoming increasingly apparent that a readjustment of the economic basis upon which the members of the medical profession offer their services to the public should be effected, under which the principles will be exemplified that the labourer is worthy of his hire.

STATUS OF HOSPITAL MEDICAL STAFF.

The insistence by Dr. William Gerry Morgan, the distinguished President of the American Medical Association, in a recently delivered address, that the services of the profession of medicine to hospitals must be regarded as the contribution of the medical staffs as individuals, and that these services cannot become in any sense the property of the institution, will arouse a note of commendation in the minds of many physicians who, I believe, regard with disapproval and concern the increasing and inordinate demands of hospital directorates and officials for free medical aid.

While every effort should be made to lower medical costs by sound organisation, voluntary coöperation between physicians, the avoidance of unnecessary expensive methods of diagnosis, the provision of moderately priced accommodation, the availability of composite fees, and the insistence that physicians shall be adequately qualified, it seems inevitable that at the rate scientific medicine is progressing, the care of the sick in the future will cost more than it has done in the past, and we cannot expect that the purchasing power of the average family will be greatly increased.

Voluntary Health Insurance the Only Solution.

How, then, may the problem be solved of placing competent medical skill within reach of all our citizens, on a basis that will ensure them every care, be just to the members of our profession, and satisfy the legitimate demands of the nurse and the hospital? In my judgment, there is only one possible solution—voluntary health insurance, instituted, organised and controlled by the medical profession, and widely applied. The alternative is some form of State medicine, which implies an admixture of politics, the selection of officials and practitioners upon a basis of influence rather than of competence, the building up of a bureaucratic institution, insensitive to advanced public opinion, and subject to influence of an undesirable character. In the words of our honoured guest, Lord Dawson of Penn, "medicine must be unfettered; knowledge and the restless spirit which prompts its progress need a freedom and flexibility which cannot be found within the ringed fence of administrative departments"—while Dr. William Mayo says: "for the State to take over the care of ordinary illness would introduce civil service mediocrity, more drugs, more routine, and less scientific attention to the patient." The field of public health must and should be the interest of Government, but private practice must remain in

the hands of the individual physician if the public is to receive the highest and best type of medical care.

To the medical men of the Dominion, confronted with a demand for medical service at a lower cost, the great insurance system, established under the British National Health Insurance Act of 1911, has always had a special interest, and has been studied with the hope that it might afford a working basis upon which to establish a system of health insurance in Canada, should such be found desirable. While this system may not be free from imperfections, its success as a measure applicable to 16,000,000 people is attested by evidence of unimpeachable authority.

The recent proposal of the Council of the British Medical Association to establish a general medical service for the nation is of such a far-reaching and significant character that it is certain to have profound influence upon economic thought in the domain of medicine throughout the Empire. It is too early, and in Canada we are too remotely situated and too unfamiliar with the needs of British medicine, to attempt even an appraisal of its value and applicability to Old Country traditions.

THE LAW OF AVERAGE.

To the student of statistics it is apparent that the medical hazards and contingencies to which mankind is subject operate with unfailing regularity under the law of average, and can best be protected against by insurance—thus spreading the cost over a large number of people and reducing individual liability to a figure the average man can meet. In this connexion may I quote the views of Dr. Lee K. Frankel, of the Metropolitan Life Insurance Company, an outstanding authority on life insurance and related problems. He says:—

> "To-day we know that fire is a hazard, we know that accident is a hazard, and we provide against these hazards under the modern method of distributing the burden of the risk. Fundamentally this is the insurance principle. Knowing this have we not found the way out? Realising that sickness is a hazard of life, can we not apply the same principle to meet its cost as we have to the hazard of death, of accident, of fire, and to the other contingencies of life? The cost of sickness must be provided for in advance of sickness, and be distributed so that it bears equally upon all."

The conclusion therefore seems inevitable that for the large majority of our people health insurance, preferably of the voluntary type, affords a sound basis upon which to supply medical aid and skill.

Closer Relationship with the Mother Country.

At a period when every effort is being made to bring about closer Empire relationships in trade and sentiment, one cannot but feel that the harassing restrictions of licensure existing in British countries at the present time should be modified in favour of a system of intra-Empire licensure applicable to British practitioners of adequate antecedents, good education, and approved character. The situation, however, is one of extreme complexity, and hitherto it has not been possible to arrange an understanding that, so far as the Mother Country and Canada are concerned, might bring about a consummation devoutly to be wished. The reasons for this failure are partly economic and partly legal, but are mainly due to the apparent impossibility of devising a formula acceptable to all concerned. It is to be hoped that means may be found whereby conflicting views may be reconciled, and an understanding arrived at, under which reciprocal rights to practise may be granted upon a mutually satisfactory basis.

Abler lips than mine have paid tribute to th debt of Canada to British medical schools and teacher and to the system of medical instruction that prevai in the Old Country, and constituted the education foundation upon which the McGill and Toront Medical Schools were established. McGill wa organised by Scotsmen, and from its inception ha followed Edinburgh methods. In Toronto an Kingston the traditions of the London rather than th Edinburgh school have prevailed. The Manitob Medical College was founded by graduates of McGi and Toronto.

Manitoba Medical College.

The story of this College, which was begun in th pioneer period, when Winnipeg was still an unrul frontier town, fairly deserves an honourable pla in the history of medical education. In 1883 1 Winnipeg doctors joined hands, under the leade ship of Dr. James Kerr (an Irishman who ha served in the Ashanti campaign under Sir Garn Wolseley, a friend of Osler and Shepherd of McGil and a disciple of Lister), and obtained from th Provincial Government a charter for the foundin of the Manitoba Medical College. The openin lecture was given on the evening of Nov. 15t 1883, by Dr. Kerr, who had been chosen Dean. Th first enrolment was of 15 students, and for its fir session the College had no settled place of abod with the exception of a dissecting room, establishe in a cottage on the edge of the city. When mo accommodation was needed, the members of th Faculty subscribed the funds required for the pr vision of a larger establishment. The first graduatin class, in May, 1886, numbered six. To-day th total number of graduates is close upon 1200, whom 800 are practising in Western Canada.

But the story of Manitoba Medical College is mo than a story of bricks and mortar, of statistics enrolments and of graduating classes. From i beginning in 1883 it was a proprietary institutio until 1919, when the medical practitioners, who we its proprietors, handed over to the University Manitoba all its property and equipment, of whic the value was about $250,000, as a gift, "on conditio that the University established a Faculty of Medicin and carry on the work of medical education in a efficient manner." With the completion in 1922 the building programme, and with the enlargemer of the teaching staff made possible by the endowmer fund provided for the Medical Faculty by th Rockefeller Foundation, the University of Manitob now provides undergraduate medical instruction an training equal in all essentials to that given in oth Canadian universities, and with an assured certaint of progress in accordance with the advance in moder educational methods, and of constantly widenin opportunities for medical research.

WINGFIELD ORTHOPÆDIC HOSPITAL.—The annu report of this hospital of the Berks., Bucks., and Oxo Association for the Care of Cripples (130 beds, thr private wards) states that the number of patients the institution increased by nearly 20 per cent., and th number of new patients attending at the clinics by ov 30 per cent. All the beds have been continuously fu and the total number of patients treated was 537. Mo beds are urgently needed, and it is proposed to erect fo open-air wards of 20 beds each at a cost of £12,000. On half of this new accommodation will be for adult patient which will make the hospital unique among orthopæd institutions. The workshops and training schools obtain three first prizes at the International Cripples Exhibitio at Exeter.

SPECIAL ARTICLES

THE ANTIRACHITIC VITAMIN D.

ANNOUNCEMENT OF A STANDARD BY THE MEDICAL RESEARCH COUNCIL.

THE Medical Research Council's Committee on ccessory Food Factors have long attempted to find nerally acceptable conventions for the quantitative cord of the activities characteristic of the different cessory factors, or so-called vitamins. As in other stances, however, any unit of activity based on the oduction of a stated degree of a biological effect, owever carefully this may be defined, must be liable wide variation with differences in the conditions der which the test is conducted. This is especially in testing for a vitamin action, where the effect on hich measurement is based is the correction of an normal condition produced by a deficient diet. he severity of the condition to be treated will vary ith differences in the dieting and treatment of the perimental animals, as well as with racial and dividual differences in the stocks. Other bio- gical standards, such as those for sera, hormones, c., held by the Council's Department of Biological andards, are based on stable standard materials, terms of each of which a unit of activity is defined hich is independent of the details of the biological ethod used in its measurement. Here a measure- ent of activity in units is made on a strictly compara- ve basis, with reference to the standard.

NEED FOR A BASIS OF MEASUREMENT.

With regard to one of the vitamins, the anti- chitic vitamin known as Vitamin D, this necessity r a common material standard was recently nphasised in the following recommendation by the mmittee :—

> Any unit or standard based directly on the response of e experimental young rats to administration of anti- chitic material is unsatisfactory, owing to the dispro- rtionate variation in the response to equal doses of parently similar animals, when tested at different seasons the year or bred in different laboratories. The Vitamin D nit should rather be referred to a stated quantity of some andard antirachitic material, with which comparison can e made by any reliable biological method.

The discovery of the method of producing this itamin artificially from ergosterol has led to its anufacture on a large scale, its issue in many forms r therapeutic use, and its addition to various pes of food materials. The proper desire of manu- cturers to use and to supply such preparations with quantitative indication of activity has led to the ppearance of several unofficial "units," mostly efined in terms of some biological effect, and having o clearly determined relation to one another. The eed for a common basis of measurement is, therefore, ccentuated, in this case, by an existing and growing nfusion. One of the provisional units current in is country—namely, that adopted by the Pharma- utical Society's Laboratories when reporting on e Vitamin D content of materials submitted to them r assay, has, indeed, been based on a material andard consisting of an oily solution of irradiated rgosterol, supplied to them for this purpose by the ational Institute for Medical Research. Only a nall quantity of this material had been prepared, owever, and sufficient data were not available to stify the assumption that it would have the stability necessary for a standard and allow the Committee to recommend it for general use.

PREPARATION OF THE NEW STANDARD.

It was accordingly decided to arrange for the preparation by the National Institute of a similar solution, on a scale sufficient for its eventual distribution to the numerous laboratories or institutions likely to require it, and to organise an investigation of its properties by different experts working on behalf of the Committee. A quantity of ergosterol from yeast, purified and dried by methods carefully recorded was subjected, in an accurately made alcoholic solution, to irradiation with the rays from a mercury arc, the physical details of the procedure being measured and recorded with the greatest practicable accuracy. All conditions known to influence the amount of Vitamin D formed should, therefore, be reproducible at any future date, or in any other laboratory, leaving only the final adjustment of a new standard to equivalence with this original one to be made on the basis of comparative biological assay. The irradiation products were carefully freed from alcohol, dissolved in pure, unadulterated olive oil, and the volume adjusted to produce a known concentration, in terms of ergosterol used. The solution was then placed, and its main bulk has since been kept in the Institute's refrigerating chamber at a temperature of −4° to 0° C.

TESTS OF STABILITY.

Evidence of the stability of such a preparation, under different conditions and over a sufficiently long period, being of central importance for a decision as to its use as a standard, the investigations promoted by the Committee have, of necessity, been of a corresponding length. The experimental results from the different contributing laboratories have recently been completed, and have now been carefully reviewed by the Committee, who have stated their conclusion from them in the following terms :—

> From these tests it appears that specimens of irradiated ergosterol, prepared in the manner described above, do retain their activity unchanged for two years if maintained at or below 0° C. If they are kept at room temperature loss of activity may occur.

COMMITTEE'S RESOLUTIONS.

The evidence of the different investigators being uniformly favourable as to the suitability of this solution in other respects for use as a standard in comparative biological measurement of Vitamin D the Committee decided to recommend its adoption as a standard, and the definition of a unit in terms of it, and adopted the following resolutions :—

(*a*) That the standard solution of irradiated ergosterol prepared and maintained by the National Institute for Medical Research be recommended for adoption as a standard for the comparative estimation of Vitamin D.

(*b*) That the unit of Vitamin D be defined as the anti- rachitic potency of a quantity of this preparation corresponding to 0·0001 mg. of the ergosterol used in its production.

(*c*) That either the X ray method, the "Line test," or chemical analysis of the bones of the experimental animals, be recommended for use in the estimation of Vitamin D.

(*d*) That supplies of the standard material be made available for general distribution from the National Institute for Medical Research, Hampstead. As the supply is limited it is hoped that users will themselves prepare standard solutions of irradiated ergosterol for use in individual tests, retaining the National Institute's material for reference. It is important that all such standard materials be kept at temperatures not exceeding 0° C.

THE PROPOSED UNIT.

It may be mentioned that the unit recommended has the same value, in terms of the weight of the original ergosterol represented, as that used for some years past in the Pharmaceutical Society's Laboratories, on the basis of the provisional standard solution supplied to them. The standard solution now recommended for general use cannot be assumed to be exactly equivalent to this, though comparative tests have not revealed a measurable difference. Apart from such difference as may exist, the unit now proposed, will, therefore, correspond to one of those already current. It is of convenient size, as representing the order of dose required for daily administration to a rat, to produce healing of rickets in a curative test; that is to say, the daily dose suitable for the conditions of a particular test will be neither a large multiple nor a small fraction of the unit proposed.

The Committee mention three biological methods of estimating antirachitic effect, which they are able to recommend. Their recommendations on this matter are obviously not meant to be exclusive. They have mentioned the methods in which, from experience of their own investigations, they have confidence, but their statement is not intended to preclude the use of other biological methods that already exist, or of better ones that further investigation may produce, provided that in every case the test is based on a comparison with the fixed standard.

DISTRIBUTION OF THE STANDARD.

As indicated in another of the Committee's recommendations, the quantity of the standard solution available will not allow it to be circulated in large quantities. Its distribution will, of necessity, be limited to those institutions which have the staff and equipment needed for its accurate application in biological assay, including proper facilities for its preservation without loss of activity. Unless the number of institutions requiring it prove to be much greater than that to which other standards are distributed, it should be possible to supply samples once or twice a year to each regular recipient for some years to come, before the preparation of a new batch of the standard solution will be required. It is proposed to make the first issue about the end of September of this year, and a memorandum giving details for the use of the standard will be sent with each first sample. It will greatly facilitate the completion of arrangements if applications from institutions wishing to receive the standard are made as early as possible, so that the Department may be able to estimate the number of separate samples likely to be required for the first and subsequent issues. All such applications should be made to the Director of the Department of Biological Standards, National Institute for Medical Research, Hampstead, London, N.W. 3.

THE PRAISE OF HINDU CUSTOMS.

IN the June number of the *Medical Review of Reviews*, published in Calcutta, Dr. Naliniranjan Sengupta takes us to task for some criticisms of Hindu customs which appeared in an annotation on conditions of childbirth in India in THE LANCET last year.[1] The main propositions in our survey, however, have long been conceded by Indian reformers themselves, and notably by Mr. Gandhi. We agree with Dr. Sengupta that there has been a tendency recently to leave out the economic factor in discussing this and similar questions, and that much of the ill-health in India is due to poverty; but when he proceeds to argue in favour of purdah and child marriage, on the ground that they are safeguards against syphilis and can apparently find nothing to criticise adversely in the present customs, we may safely leave him to his own more enlightened countrymen. There is, however, another side to Dr. Sengupta's argument and a very interesting one. He protests that at the present time it seems impossible for an Englishman to find virtue in any Indian custom, and proceeds to give an account of certain time-honoured practices based on rules laid down in the old Hindu scriptures which are often admirable. Dr. Sengupta holds that some of the maligned social customs have actually done much to preserve the population under conditions which, if not mitigated in any way, might easily have proved fatal. Considering the chronic state of semi-starvation in which many of the Indian people habitually live, he ascribes their comparative immunity from rickets in many parts of India to the immemorial custom of rubbing infants with oil and exposing them at intervals to the sun's rays. Similarly, he believes the low incidence of gastro-intestinal diseases in children, noted in a recent report of the health officer of Calcutta, to be due to the very ancient practice, which used to be almost universal, of boiling the household milk immediately on receipt. It is true also that the ancient scriptures of the Hindus inculcate habits of cleanliness which, however perfunctorily they may be kept up by many devotees to-day, are far in advance of the practice of most Western races. The rules insist on the early morning bath, the habitual use of a fresh toothbrush (consisting of a twig of the neem tree), careful washing of the hands before and after meals, and ablution after visits to the latrine. Specific rules are, moreover, laid down for periodic sexual abstention; intercourse is forbidden during menstruation and pregnancy for several weeks after parturition, and at various other stated times. Dr. Sengupta justly adds that there is much that is admirable in the family life of his co-religionists, and quotes the late Sir George Birdwood, I.M.S., who praised the Mahratha Brahmin ladies as perfect daughters, wives, and mothers whose virtues were deeply rooted in religious convictions. Dr. Sengupta contends that certain factors in the deterioration of the health of the Indian people are of European introduction. Syphilis, he says, comes from abroad, and is accordingly known as the "feringi" (foreign) disease. The adulteration and impoverishment of foodstuffs is regarded as the direct outcome of so-called civilising influences, the modern milling of rice, and blending of ghee with vegetable products having deprived the people of their vitamins. There is something to be said from his point of view, but when he blames Europe unconditionally for malaria he is going too far. To state that this disease was practically unknown in India before the 'sixties of the last century is a grotesque exaggeration which leads one to suspect the accuracy of more reasonable statements. The fact that malaria has been spread by otherwise beneficent railway and irrigation schemes is one of the tragedies which are liable to attend any efforts to improve communications and to safeguard the country against famines, but in working out plans for the future it ought to be possible to minimise this danger. Dr. Sengupta is a staunch upholder of everything Indian, but like so much of the pro-Indian propaganda at the present time, his article makes no attempt to give credit where credit is due.

[1] THE LANCET, 1929, i., 140.

ST. PETER'S HOSPITAL.—Last year 589 patients were admitted to the wards of this Covent Garden hospital for stone and other urinary disesases. It is the only institution of the kind with a supply of radium. A long lease of premises nearly opposite the hospital in Henrietta street has been acquired, and a pathological department has been established there. The hospital itself is being re-arranged and modernised.

OBITUARY

ARTHUR ROBERTSON BRAILEY, M.Chir. Camb., F.R.C.S. Eng.

Surgeon-Captain Brailey, who lost his life when the yacht *Islander* foundered last week on the Cornish coast near Fowey, was younger son of the late Mr. W. A. Brailey, ophthalmic surgeon to Guy's Hospital, and brother of Mr. W. H. Brailey, whom he followed at Westminster School, Cambridge University, and Guy's Hospital. At Cambridge he was minor and foundation scholar of Downing College. Qualifying in 1903, and becoming F.R.C.S. Eng. and M.Chir. Camb. in the following year, Arthur Brailey himself specialised in ophthalmology, and held the post of clinical assistant in the eye department at Guy's before he went to China, where he acted as general and ophthalmic surgeon at Chinkiang Hospital. During the war he was consulting ophthalmic surgeon to the Royal Air Force and surgeon-captain in the Royal Naval Volunteer Reserve, rising to the position of senior medical officer to its London Division, and hon. surgeon to the King. Surgeon-Captain Brailey was only 52 years old at the time of his tragic death, but had already retired from practice to leave more time for his favourite pursuits of farming and yachting.

HUGH COLLIGAN DONALD, M.B., C.M. Glasg., F.R.C.S. Edin.

Dr. Hugh Donald, who died in Paisley on August 24th after an operation, was 60 years of age and one of the most distinguished practitioners in the West of Scotland. He came of a medical family, his father and two brothers also being in practice. Qualifying in 1891 and taking the higher surgical diploma in 1897 after an assistantship in the Leeds school, Dr. Donald obtained an unusual number of appointments, including that of surgeon to the Alexandra Infirmary, Paisley, consulting surgeon to the Royal Victoria Eye Infirmary, and to the Johnstone Hospital. During the South African War he was civil surgeon in charge of the 3rd Cavalry Brigade Composite Regiment Field Force, and returned with the Queen's Medal and four bars. He had a volunteer commission in the territorial army, and during the late war he acted as senior medical officer to the A. and S. Highland Brigade, carrying out much useful work in establishing hospitals in France. When the new venereal diseases clinic was established in Paisley Dr. Donald became surgeon in charge, and later added the Greenock clinic to his work. His all-round competence, we are told, gained him the confidence of medical colleagues, who appreciated his readiness to help new developments.

FREDERICK GEORGE LLOYD, M.R.C.S. Eng.

Dr. F. C. Lloyd, whose death took place in Kensington on August 6th, was in his sixty-sixth year. Although his health had been failing for some years the serious breakdown of his heart a fortnight before he died was quite unexpected. Son of Major Edward Lloyd and grandson of Sir Robert Stanford, Frederick went to the City of London School and followed his brother Rickard as a student at St. Bartholomew's Hospital, qualifying in 1892. Four years later he was in medical charge of the *Harlech Castle* on its voyage from Natal to Plymouth, bringing back 300 sick and wounded men after the Jameson raid. During the South African War he was first attached to the Brigade of Guards Hospital in London, and then civil surgeon in the Field Force, receiving medal and clasps. During the latter part of the late war he was medical officer to the late Lord Dunraven's yacht *Grianaig*, which was placed at the disposal of the Government. A regular attendant and sometime vice-president at meetings of the West London Medico-Chirurgical Society, he frequently took part in its discussions; a paper on Diseases of the Appendix Vermiformis and their Treatment, read in 1904, was his first contribution to a subject he made particularly his own. More recently he opened a discussion on the interim report of the Consultative Council of the Ministry of Health on Medical and Allied Services, in which he took a deep interest. For many years he practised in Kensington, where he shared a house with his brother. He was buried in Hove Cemetery, the vicar of Barnes Church, which for many years Dr. Lloyd regularly attended, officiating.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 16TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 95 (last week 86); scarlet fever, 1534; diphtheria, 969; enteric fever, 73; pneumonia, 478; puerperal fever, 61; puerperal pyrexia, 130; cerebro-spinal fever, 11; acute poliomyelitis, 25; acute polio-encephalitis, 2; encephalitis lethargica, 12; continued fever 2; dysentery, 4; ophthalmia neonatorum, 117. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 19th–20th was as follows: Small-pox, 183 under treatment, 3 under observation (last week 209 and 2 respectively); scarlet fever, 1669; diphtheria, 1873; enteric fever, 34; measles, 174; whooping-cough, 80; puerperal fever, 22 (plus 11 babies); encephalitis lethargica, 121; "other diseases," 26. At St. Margaret's Hospital there were 12 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 7 (1) from measles, 5 (1) from scarlet fever, 11 (3) from whooping-cough, 29 (10) from diphtheria, 42 (10) from diarrhœa and enteritis under two years, and 16 (1) from influenza. The figures in parentheses are those for London itself.

The death from enteric fever outside London occurred in Sheffield. No great town reported more than two deaths from diphtheria, or more than one from whooping-cough or measles. Birmingham and Manchester each reported 4 deaths from diarrhœa, Bolton and Sheffield each 3, West Ham, Plymouth, and Liverpool each 2.

The number of stillbirths notified during the week was 284 (corresponding to a rate of 38 per 1000 births), including 55 in London.

VICTORIA INFIRMARY, NEWCASTLE-ON-TYNE.—The 179th annual report, which covers the year 1929, shows that 14,460 in-patients were admitted; they stayed on an average 15 days. Surgical cases numbered 8583, and the gynæcological department dealt with 1442 cases. There were 132,358 out-patients, an increase of more than 3500. The 572 beds were every day insufficient, and although the waiting list has been carefully reviewed at the end of last year it still contained 2603 names, the highest, with the exception of one occasion, yet reached. More than 22,000 accidents were treated, 1470 of which were the direct result of motor traffic. Of these patients 436 were detained and, computed on the average length of stay, they were responsible for the occupation of 20 beds each day throughout the year. Since 1925 the number of motor accident patients has more than doubled. The Nurses' Home has been extended to accommodate 150 nurses, and three of the wards formerly occupied by pensioner patients are to be used for the provision of 86 pay beds.

Appointments

St. Thomas's Hospital: HILL, H. GARDINER, M.D. Cantab., F.R.C.P. Lond., Physician in Charge of Out-Patients; BOGGON, R. H., M.B., B.S. Lond., F.R.C.S. Eng., First Assistant to the Surgical Unit; STEWART, H. H., M.B., B.Chir. Cantab., F.R.C.S. Eng., Registrar to the Surgical Unit; BELL, A. D. C., B.M., B.Ch. Oxon., Registrar to the Children's Department (Medical).

Vacancies

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road.—M.O. At rate of £110.
All Saints' Hospital for Genito-Urinary Diseases, Vauxhall Bridge-road, S.W.—H.S. At rate of £150.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Barrow-in-Furness, North Lonsdale Hospital.—Two H.S.'s. Each £175.
Bath, Royal United Hospital.—Asst. H.S. At rate of £120.
Bedford County Hospital.—H.S. £175.
Blackburn Royal Infirmary.—Third and Fourth H.S.'s. £175 and £150 respectively.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Bristol Royal Infirmary.—Asst. for Cancer Research Laboratories. £400.
Burslem, Haywood Hospital.—Res. M.O. £175.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff City Mental Hospital, Whitchurch.—Post-Graduate Research Studentship. £100.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Asst. Anæsthetist.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100–£175.
City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.
Colchester, Essex County Hospital.—H.P. £150. Also Asst. H.S. and Registrar. £120.
Derby, Derbyshire Hospital for Sick Children.—Res. M.O. At rate of £150.
Derby, Derbyshire Hospital for Women.—H.S. At rate of £150.
Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.
Eastbourne, Princess Alice Memorial Hospital.—H.S. At rate of £100.
Eastcote, Middlesex, St. Vincent's Orthopædic Hospital.—Res. M.O. At rate of £150.
Edinburgh, Jordanburn Nerve Hospital, Morningside Park.—Asst. Phys. £400.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Second H.S. At rate of £120.
Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. £150 and £140 respectively.
Halifax Royal Infirmary.—Third H.S. £150.
Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—Two H.P.'s. Each at rate of £150.
Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O. £200.
Hull Royal Infirmary.—Hon. Physician.
Ilford, King George Hospital.—Res. M.O. £200.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150 Also H.S. At rate of £120.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Leeds, St. James Hospital.—H.P. and H.S. £200.
Leicester Royal Infirmary.—H.S.'s and Cas. O. Each £125.
Liverpool and District Hospital for Diseases of Heart.—H.P. At rate of £52.
Liverpool Eye and Ear Infirmary, Myrtle-street.—Hon. Asst. S. to Ear, Nose, and Throat Dept.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.
London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200. Also Two Surg. Regs. Each £100.
Macclesfield General Infirmary.—Res. H.S. At rate of £180.
Maidstone, Pembury Institution.—Asst. M.O. £200.
Manchester, Ancoats Hospital.—H.S. At rate of £100.
Manchester and Salford Hospital for Skin Diseases.—H.S. £100.
Manchester, Baguley Sanatorium.—Asst. M.O. £350.
Manchester Joint Committee on Cancer Research.—Asst. in Cancer Research Laboratories. £400–£650.
Manchester, Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s. At rate of £150.
Manchester, Royal Children's Hospital, Pendlebury.—Res. M.O. and Res. Surg. O. At rate of £125.
Manchester University.—Pilkington Fellowship in Cancer Research. £300.
Manchester Victoria Memorial Jewish Hospital, Cheetham.—Sen. H.S. £250.
Merthyr General Hospital.—Res. H.S. At rate of £150.
Middlesex Hospital, Barnato Joel Laboratories.—Asst. in Radiological Research. £350.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. At rate of £150. Also H.P. and H.S. Each at rate of £125.
National Hospital for Diseases of Heart, Westmoreland-street.—Res. M.O. Also Out-patient M.O. At rate of £150 and £125 respectively.
Northampton General Hospital.—H.P., Two H.S.'s, and Two Asst. H.S.'s. All at rate of £150.
Nottingham, General Hospital.—H.P. Also Second Cas. O. Each at rate of £150.
Oldham, Boundary Park Municipal Hospital.—Res. Asst. M.O. £200.
Oldham Royal Infirmary.—Two H.S.'s. Each at rate of £175.
Plymouth, South Devon and East Cornwall Hospital.—Asst. Pathologist. £350.
Princess Louise Kensington Hospital for Children, North Kensington, W.—H.S. and Cas. O. At rate of £75.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—District Res. M.O., Asst. Res. M.O. Also Res. Anæsthet. Each at rate of £80.
Queen's Hospital for Children, E.—Cas. O. At rate of £100.
Reading, Royal Berkshire Hospital.—Cas. O. and Res. An- thetist. At rate of £150.
Royal Eye Hospital, St. George's Circus, S.E.—12 Salar Refractionists, 12 Clinical Assts., 1 Pathologist.
Royal National Orthopædic Hospital.—H.S. At rate of £150
Ryde, Royal Isle of Wight County Hospital.—Vacancy on H Med. Staff. Also Res. H.S. £180.
St. John's Hospital, Lewisham, S.E.—Res. Cas. O. £100.
St. Paul's Hospital for Diseases of the Genito-urinary Organs, Endell-street, W.C.—Res. M.O. Also H.S. At rate £200 and £150 respectively.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Gard W.C.—H.S. At rate of £75.
Salford Royal Hospital.—Two H.S.'s Each at rate of £125.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £8
Shrewsbury, Eye, Ear and Throat Hospital.—H.S. £200.
Southampton Children's Hospital and Dispensary for Women Res. M.O. At rate of £100.
South Shields, Ingham Infirmary.—Jun. H.S. £150.
Stafford, Staffordshire General Infirmary.—H.S. and H.P. rate of £200 and £150 respectively.
Stoke-on-Trent, N. Staffordshire Royal Infirmary.—Asst. H.P. £1
Swansea Hospital.—H.S. £150.
Swaziland.—M.O. £500.
Tilbury Hospital, Essex.—H.S. At rate of £150.
Tynemouth, County Borough of.—Asst. M.O.H. £540.
Uxbridge, Middlesex, Hillingdon Institution.—Res. M.O. £60
Victoria Hospital for Children, Chelsea.—H.S. At rate of £1
Walsall, Manor Hospital.—Res. Asst. M.O. £200.
West Bromwich and District General Hospital.—H.P. and C H.S. Each at rate of £200.
West London Hospital, Hammersmith-road, W.—H.P., T H.S.'s., and Res. Anæsthetist. Each at rate of £100.
West Lothian, Bangour Mental Hospital.—2nd Asst. M.O. £3
Willesden Municipal Hospital.—Res. M.O. £250.
Wolverhampton and Midland Counties Eye Infirmary.—H.S. £1
Woolwich and District War Memorial Hospital, Shooters H S.E.—H.S. At rate of £100.
York County Hospital.—H.P. £150.

The Chief Inspector of Factories announces vacant appointme for Certifying Factory Surgeons at Llanybyther (C marthenshire) and Paisley (Renfrewshire).

MEDICAL NEWS

Society of Apothecaries of London.

At recent examinations the following candidates pass in the subjects indicated:—

Surgery.—G. P. Charles, Sidney and Charing Cross Hos; H. G. Edmunds, University College Hosp.; C. W. Ellis, St. Bart.'s Hosp.; E. J. Jones, Cardiff; N. I. Kronenberg, a W. Montgomery Smith, Guy's Hosp.; H. I. Newman, Lond Hosp.; R. D. Newton, St. Bart.'s Hosp.; K. V. Pillai, M chester; L. Sachs, St. Mary's Hosp.; I. J. Todd-Nay King's College Hosp.; and G. H. C. Walmsley, Manchest

Medicine.—H. W. E. Dickey, Manchester; E. A. Freywir Heidelberg; N. I. Kronenberg, Guy's Hosp.; J. M. L. Lo St. Mary's Hosp.; W. Montgomery Smith, Guy's Hos H. I. Newman, London Hosp.; and I. J. Todd-Naylor, Kir College Hosp.

Forensic Medicine.—M. M. Barritt, Manchester; J. S. Coutts, St. Mary's Hosp.; C. R. Graham, Kingston, Ontar M. Halperine, Paris and London Hosp.; N. I. Kronenb and W. Montgomery Smith, Guy's Hosp.; H. I. Newm London Hosp.; W. K. Schnarr, Guy's Hosp.; G. H. Walmsley, Manchester; and I. M. Williams, Edinburgh.

Midwifery.—S. Gurevich, Charing Cross Hosp.; M. Halperi Paris and London Hosp.; E. I. B. Hawes, St. George's Hos W. Montgomery Smith, and W. W. Parry, Guy's Hosp.

The Diploma of the Society was granted to the follow candidates, entitling them to practise medicine, surgery, a midwifery: M. M. Barritt, G. P. Charles, H. W. E. Dick H. G. Edmunds, C. W. Ellison, E. A. Freywirth, N. I. Kron berg, W. Montgomery Smith, I. J. Todd-Naylor, and G. H. Walmsley.

University College Hospital Medical School.

The Goldsmid entrance exhibitions for 1930 have b awarded to Mr. G. Quist and Mrs. M. H. James.

University of Manchester.

Application is invited for the Pilkington Fellowship Cancer Research, of the value of £300, tenable for one ye

University of Aberdeen.

Dr. David Campbell, Pollok lecturer in pharmacolo and therapeutics at the University of Glasgow, has b appointed Regius professor of materia medica in the pl of Prof. Charles Robertshaw Marshall, whose resignati takes effect next month.

Department of Health for Scotland.

Dr. James Law Brownlie, county bacteriologist a pathologist in Lanarkshire, has been appointed a medi officer of the Department. Dr. Brownlie, who graduat in medicine at Glasgow University in 1913, was reside for several years in Glasgow fever hospitals, and was six years assistant bacteriologist in the Glasgow Corporati laboratory.

NOTES, COMMENTS, AND ABSTRACTS

MEASLES CONTACTS:

THEIR EXCLUSION FROM SCHOOL.

By DUNCAN FORBES, M.D., B.Sc., D.P.H.,
MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER FOR BRIGHTON.

MEASLES is one of the most highly infectious of diseases. It starts as a cold in the head and the patient also coughs. He is not usually isolated for the first few days, since his parents do not know what he is suffering from until the typical rash appears. During these days he has been talking and coughing and in so doing has spread all around him a fine spray, the tiny droplets of which carry the infection to those of his companions who inhale them. It is no wonder, then, that practically all children who have mixed freely with other children for two or three years in schools, Sunday schools, creches, and cinemas have had an attack of measles. In towns practically all elementary school-children sooner or later develop the disease; in the country a few escape. The experience in every town is the same and no means have been discovered to control the spread of the disease.

MEASLES MORE DANGEROUS THAN SCARLET FEVER.

The annual average number of deaths for the period 1919–28 was 4500 from measles and 1000 from scarlet fever, so that measles took the larger toll. Although it is thus established that measles is more dangerous to the nation than scarlet fever, this does not mean that measles is more dangerous to the individual attacked. Scarlet fever in typical form attacks a relatively small proportion of the population, whilst very few escape measles; the number of deaths recorded, therefore, has no relation to case-mortality. To impress a mother with the danger of measles by saying that her child is suffering from a more dangerous disease than scarlet fever is therefore wrong, since the mother is apt to think in terms of case-mortality.

It may be argued that if all children who mix freely with their fellows develop measles it is futile to attempt to prevent its spread. But attacks of measles are most dangerous to children from one months to two years old, and thereafter the risk becomes less and less until at school age (five years) and onwards the risk is a very small one. This is proved from figures which show that at the ages 3, 4, and 5) when measles is becoming more and more prevalent the number of deaths becomes fewer and fewer. Not only is measles enormously more dangerous to the very young than to their elders, it is also far more dangerous in the winter than in the summer months. Thus the main objects should be to protect the children under five and if possible to delay epidemics until the summer.

PROTECTION OF THE VERY YOUNG.

There are two creches in Brighton to which the infants and children of mothers who have to go out to work are admitted. Any case of measles occurring in the creches is reported and the creche is closed down for the week during which the secondary cases are expected. If a number are known to have already suffered from measles it is sometimes found worth while to allow them to continue to attend. In spite of the most stringent precautions taken in these and other creches this gathering together of infants and young children leads to the infection and death of numbers of infants and toddlers each year, and the most stringent rules for exclusion and closure are abundantly justified. In the infant department of elementary schools in the presence of measles the Brighton rule is to exclude delicate children and all children under five years of age. Before this rule was introduced I have known of an elementary school-child under two dying from measles; on inquiry I found that no child under three should have been admitted, but that for children under five the mother's statement of age was taken as correct. I have no doubt of the advisability of the exclusion of all children under five.

DELAY OF EPIDEMICS.

When an epidemic begins in November it is customary to prolong the Christmas holidays of the schools infected, not with the object of stopping the epidemic but of checking the rapidity of its spread. This action does not do much good, since the epidemic is again in full swing towards the end of January and in February and March, all inclement cold months. No doubt if infected schools could be closed for, say, six weeks at Christmas, the epidemic, although it would restart on the re-opening of the schools, would be at its height in a town the size of Brighton after the cold weather was over. The Ministry of Health and Board of Education, however, do not favour school closure, which they rightly say only postpones and prolongs an epidemic (Memorandum on Closure of and Exclusion from School). The curious thing is that although it is stated in this memorandum just referred to that the spread of measles cannot be stopped even by complete school closure, very specific advice is given regarding the exclusion of contacts. It would seem that no regard is paid to the fact that if the large measure—school closure—will not stop an epidemic a whole lot of niggling rules about the exclusion of contacts are unlikely to have any appreciable effect; incidentally these rules regarding exclusion of contacts involve much clerical work at health offices and to teachers. The advantage of following the official rules is that the exclusion of contacts gives the impression to the public that all possible steps are being taken to combat the epidemic and meets the criticisms of those who have not studied the subject.

NON-EXCLUSION OF HEALTHY CONTACTS.

What the man in the street cannot understand is why all contacts should not be at once excluded. The chief reason is that they should at all costs be kept as far as possible apart from children under school age. It is many times more important that contacts should not infect any 1–5 year old child of other families than that they should be kept away from classmates who are also contacts and who will be probably infected in any case within the next few weeks. It should also be remembered that the mother has instructions to keep these contacts at home on the slightest sign of cold, and that the class teachers are also on the look-out.

SUGGESTED CHANGES IN ROUTINE PRACTICE.

The exclusion of home contacts attending infected schools should be abandoned. On the other hand, contacts attending uninfected schools should be excluded whether or not a previous attack is reported. Sunday schools are spreaders of the disease from one district to another, children often going to Sunday schools some distance from their homes. It is very important that contacts should be excluded from Sunday school. More use of school closure should be made to delay the spread of an epidemic through a town in the winter months. It should be left to the Medical Officer of Health to judge how school closure can be used with the greatest effect. In this connexion the health authorities should have power to close Sunday schools; they should also have power to close cinemas to children. School closure only likely to delay spread should not be practised in the warm months if thereby the epidemic is liable to be delayed to the winter months.

At all seasons steps should be taken to prevent the infection of the very young by the exclusion of the children under five from school and to ensure the closure of creches in the presence of measles. Careful

inquiry should be made to prove or disprove the case against infant welfare centres as spreaders of measles and whooping cough and "common" colds. Certainly mothers should be not allowed to stay longer than necessary at such centres.

CLASSIFIED EXAMINATION QUESTIONS.

A REPRODUCTION of questions set in medicine, surgery, and midwifery from 1911 to 1929, classified under the various systems and arranged in the date-order of their occurrence, cannot fail to interest students of medicine. Dr. Gerald Beeston [1] found when he was reading for his qualifying examinations that by concentrating separately upon the diseases of the various systems and organs in turn, and subsequently working through a large number of questions set upon a particular system or organ, he obtained a thorough grip of the subject and got through a vast amount of reading. Moreover, by following such a scheme of revision, the more important and everyday aspects of medicine, surgery, and midwifery were emphasised and impressed upon his mind. He decided to give others the benefit of his experience, and prepared a book of questions. While the book is compiled solely from the final examination papers of the Royal Colleges of Physicians and Surgeons of London and England, the scope covered by the questions is sufficiently wide to render it of value to anyone about to sit for any examination for medical qualifications. As an indication of the importance of each subject, questions (which are conveniently grouped under systems or organs or branches of medicine) have been repeated just as often as they occurred. For example, among diseases of the respiratory system questions on pleurisy, pleural effusion, or empyema occur 16 times in the 19 years in medical or surgical papers. Blank lines opposite a year imply that no questions were asked about that section in that year. This and subsequent editions which will be issued from time to time to include the latest questions will have a certain value for the medical historian as well as for succeeding generations of students. He will note with interest that no questions on diseases of the endocrine glands were asked until 1927, that the first question on artificial pneumothorax was put in 1925, and that the first mention of radium in gynæcology occurs in 1926, when insulin therapy also comes into the lists. In this last case, the short period between the time of discovery and the achievement of that degree of acceptance justifying inclusion in a qualifying examination must be nearly a record.

A students' manual of even wider scope [2] has recently been compiled from examination papers set by some of the Scottish licensing bodies. These include not only the final subjects but also questions set in botany, zoology, chemistry, physics, anatomy, and physiology. They are not classified according to subject matter, and are likely to be used mainly by those students who are prepared to work through papers systematically, and by those who wish to practise answering all the questions in any paper in the allotted time.

NATIONAL INSTITUTE FOR THE DEAF.

THE sixth annual report of the Executive Committee of the National Institute for the Deaf, which was taken as read at the annual meeting of the Institute on May 30th, when Mr. Baldwin addressed the meeting (see THE LANCET, June 7th, 1930, p. 1251), has now been published, and the work done justifies the increasing support which is being received by the committee. The immediate aims of the Institute show that the work is national in scope. So much information has been collected proving the existence of social and economic hardship among the deaf that general relief, it would seem, can only be effected adequately by organised public assistance, when clear arguments are forthcoming to induce the Government to make a full inquiry into the situation. A departmental committee, such as was set up in the case of the blind, might well be directed to inquire not so much into the cause and prevention of deafness as into the methods for the education and training of the deaf in all stages of their career. It is more than 40 years since any Government department has made an inquiry into the position of the deaf. The National Institute has been in active operation for only five years, but has during that period done a great deal of useful work. Its hands are tied by lack of adequate funds, the ordinary income being insufficient to meet expenses, and we trust that generously minded people will realise its urgent need. The address of the National Institute is 2, Bloomsbury-street, London, W.C. 1.

DOWSING.

THE dowsing rod for the discovery of subterranean minerals or water has been in use throughout modern civilisation and is associated with the taking of auguries in ancient Rome. The activities of a French priest in this country have recently been mentioned in the daily press and brought the subject up for one of the constant recurrences of discussion, while at the same time "a member of an old French aristocratic family which has been well known in the North of France for six hundred years" has written a little manual which purports to communicate to the reader the principles of dowsing and the ability to make practical use of them.[1] The Vicomte de France, in his volume, departs at once from the methods of the augur, because he is unable, through the nature of things, to display the actual events; he can only describe the technique for employing the virga divina, and publish the results claimed, whereas the augur of old, by actual dissection of the victim, would demonstrate the arrangement and collation of parts on which he depended for his prophecy. Begging the whole question in the first sentence of the book, M. de France states that it is well known that with the help of a hazel rod subterranean water can with certainty be found, when he proceeds to describe the manœuvres which should be employed, protesting that the mysterious semblance which revolted reasonable minds disappears under the informing words. Unfortunately, nothing of the sort occurs, because, whether the divining rod is manipulated under the cloak of magic or employed with what is assumed to be scientific precision, dictated by the laws of physics, the fact still remains that the connexion between the manœuvres and the result is unexplainable. Of course we can acquiesce, if we convinced, in the theory that we are faced with phenomena analogous to those which attend wireless telegraphy; or we can believe that some electric force is involved whose working remains for demonstration. In support of the latter suggestion "the experiments of Abrams, the late celebrated American doctor" are adduced, and we are told that from his work there "has arisen a new method which consists in determining the abnormal vibrating periods of a patient and in re-establishing the normal dynamic while suppressing the pathological vibrations by the use of suitable agents." We doubt whether M. de France will convince many of our readers, by adducing the support of the late Dr. Abrams, that he has placed before them in any scientific manner the explanation of the successes claimed for the dowser. If he has done so, we may join him in thanking "the humble country clergymen of France" whose practical work as water-diviners appears to have led to the writing of this book. But there is no unreasonable scepticism displayed if we withhold this gratitude.

[1] The Conjoint Finals. London: John Bale, Sons and Danielsson. 1930. Pp. 135. 6s.

[2] Medical and D.P.H. Examination Papers (1926–1929) for the Degrees of the University of Edinburgh and the diplomas of the Royal College of Surgeons (Edinburgh), Royal College of Physicians, and Royal Faculty of Physicians and Surgeons (Glasgow). Edinburgh: E. and S. Livingstone. 1930. Pp. 186. 3s. 6d.

[1] The Modern Dowser, a guide to the use of the divining rod and pendulum. By Le Vicomte Henry de France. Translated by A. H. Bell. London: G. Bell and Sons, Ltd. 1930. Pp. 3s. 6d.

ADDRESSES AND ORIGINAL ARTICLES

THE SYNTHETIC ACTIVITIES OF THE ANIMAL CELL.*

BY H. S. RAPER, C.B.E., D.Sc., M.B. LEEDS, F.R.S.,
BRACKENBURY PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF MANCHESTER.

UNLIKE the chemist, the animal cell has a very limited choice of raw materials from which synthesis must start. These are the components of the common foodstuffs. When they have undergone the preliminary processes of digestion they provide in all about 30 substances which may be regarded as available for the building up of new compounds by the cell. They consist of about 20 amino-acids, two purine bases, three pyrimidine bases, three hexoses, glycerol, and higher fatty acids. It is true that there may be other hitherto undiscovered components of foodstuffs which are important as raw material for synthesis in the animal cell, but they can be but few in number and present in small amount.

Substances Synthetised from Unidentified Raw Materials.

Given this list of raw materials can we indicate which is the likely starting-point for the synthesis of substances whose constitution is known or partly known? This question must still be answered in the negative for such well-known products as cholesterol and the unconjugated acids of bile. It is possible that the experiments of Channon, who demonstrated that addition of spinacene to the diet of rats caused the cholesterol content of the liver to increase to double its usual amount, may afford a clue to the origin of this substance, but it is difficult to conceive of spinacene being the raw material for this synthesis in the herbivorous animal. As for the bile-acids, we are in complete ignorance of the substance or substances from which they are built up. The probable raw material for the synthesis of the purine bases, which are components of nuclear material and therefore present in all cells, must also be answered in the negative, but with less emphasis than in the case of cholesterol and the bile-acids. The amino-acid histidin, which contains a five-membered ring similar to that found in the purine bases, is their most likely precursor on structural grounds. The synthesis of cholesterol, that of the bile-acids, and of purine bases are still problems in the purely chemical sense. When the chemist has indicated their likely solution it will be the task of physiology to find out the mechanism by which the cell brings about the necessary chemical processes.

An example of a synthetic product which bears a fairly close structural relationship to two of the amino-acids which are found in proteins is adrenalin. These two amino-acids, phenylalanin and tyrosin, have practically the same carbon skeleton as adrenalin. Either of them might give rise to adrenalin by successive oxidation, methylation of the amino group, and loss of carbon dioxide. That a part of the necessary oxidation process can be brought about by means of an oxidising enzyme has already been demonstrated. This enzyme, tyrosinase, will oxidise tyrosin to 3:4-dihydroxyphenylalanin. It is, therefore, conceivable that the first stage of the synthesis from tyrosin occurs in this way in the cell. If, however, we consider how we may find out whether a process of this kind, operating in the cells of the adrenal gland under specific conditions, gives rise to adrenalin, many difficulties appear. The discovery of the mechanisms by which adrenalin is formed, although a simple problem at first sight, is probably in reality very complicated.

The case of thyroxin is comparable with that of adrenalin. Thyroxin is a relatively simple chemical substance which could conceivably be produced by the oxidation of diiodotyrosin. The last-named compound has recently been shown to be present in the thyroid gland and this makes the presumption that it is the mother substance of thyroxin all the stronger. Yet it has not been demonstrated either in vitro or in vivo that thyroxin may be produced from diiodotyrosin.

These two instances of adrenalin and thyroxin show that, even when there is a reasonable presumption that we know the raw material from which the synthesis in the cell starts and the chemical processes concerned, the proof that our hypotheses are correct is far from simple.

Substances Synthetised from known Raw Materials by unknown Chemical Reactions.

We may now pass on to consider a process in which the raw material is known with certainty but the chemical reactions by which the synthesis takes place are relatively obscure—the production of fat from carbohydrate. Lawes and Gilbert, in their classical experiments at Rothamsted on the fattening of farm stock, showed indubitably that animals can produce fat from starch. It has been confirmed since by others. Since the starch is converted into glucose in the alimentary canal prior to absorption we may consider glucose as the starting-point of the synthesis.

The evidence for the mechanism of synthesis of the fatty acids from some simple reactive substance which is first produced by degradation of glucose, such as acetaldehyde or pyruvic acid, is purely chemical and the grounds on which it can be put forward are largely chemical ones. Is there any physiological support for this scheme? Studies of the synthesis of fat in animals have yielded very little so far. It is, however, known that acetaldehyde and pyruvic acid, the intermediates postulated in the hypothesis just mentioned, can be produced in the body. When we know what the conditions are which set the process of fat synthesis going, and when we are able to reproduce them at will in animals, it may be possible to determine what are the intermediate substances concerned.

More success has been achieved by a study of the formation of fatty acids in micro-organisms, some of which possess this faculty in a remarkable degree. Bacteria which form butyric acid from glucose have been found to produce in addition both lactic acid and acetaldehyde. These same bacteria will also produce butyric acid from pyruvic aldol though not from aldehyde ammonia, aldol, or pyruvic acid itself. It appears probable that the processes by which these lower members of the series of fatty acids are formed in bacterial fermentation may be the same as those by which higher members of the series are formed in animals. The production of fat is a process which is common to a great variety of living organisms, both simple and complex, animal and vegetable. It is not

* Abridged from an address delivered to the section of Physiology of the British Association for the Advancement of Science on Sept. 4th.

unlikely, therefore, to be carried out by the same series of chemical reactions wherever it is found. It may be that we shall eventually discover the reactions responsible for the synthesis of fat in animals by investigating the processes by which it occurs in vegetable forms, such as bacteria or moulds.

Syntheses from known Raw Materials by partially known Chemical Processes.

We have also to consider how the synthetic product is dealt with in the cell so as to protect it from the disruptive agencies which exist there. Arrangements for this purpose must be present, since we know that substances may accumulate in cells which contain enzymes that hydrolyse them. For example, fat and lipase coexist in the liver cell and also glycogen and amylase. The phenomena of autolysis illustrate the same fact too. Whatever these arrangements are, they appear in certain instances to be closely associated with the life of the cell, for after death they cease to operate and the synthetic product is again broken down. However difficult it is to form a conception of them it may be necessary to do so, since they must form a part of any system which is put forward to explain synthesis as a result of the intervention of surface phenomena.

There is little or no doubt about the raw materials or some of the chemical reactions involved in the production of glycogen and of proteins.

Glycogen, which has the empirical formula $C_6H_{10}O_5$, has recently been shown to be constituted like starch on the basis of continuous maltose units, or, what amounts to the same thing, a conjugated chain of α-glucose units. It has also been proved that when glycogen breaks down in the liver it gives rise to glucose. Recent work suggests that there may be some configurational difference between glycogen and starch which accounts for their difference in behaviour with diastatic enzymes. Be that as it may, it appears natural to assume that the synthesis of glycogen from glucose in the cell is brought about by the simple reversal of a hydrolysis which may be catalysed by enzymes under appropriate conditions. These conditions have, however, not yet been realised in vitro.

The failure to obtain evidence of the synthesis of glycogen from the products of its hydrolysis makes it legitimate to consider whether we are right in adopting the orthodox view that the synthesis of glycogen from glucose in the living cell is brought about by a reversal of action of the enzyme or enzymes which hydrolyse it.

A consideration of all the data which have been accumulated regarding the synthesis of glycogen makes it probable that more than the mere reversal of enzyme action is concerned. It is certain that the cells in which it occurs must be supplied with oxygen. Fletcher and Hopkins also showed with muscle that its structure must be maintained and with liver the synthesis certainly only takes place in the intact organ. Do not these facts point to the conclusion that it is only the living cell that can bring about this synthesis? And if this be so, cannot we go further and suggest that the substances from which glycogen is produced or bodies derived from them must first become bound up with or at some stage form an integral part of the living structure before they are converted into glycogen. The evidence at least suggests that some such conception of the process may not be far from the truth.

Proteins.—In the early part of this century rapid advances were made in our knowledge of the structure of proteins. These advances led to a picture of protein structure which has become generally accepted —namely, that the protein molecule is formed b the union of amino-acids through an amide linkag It is, however, unlikely that this is the only bond union between the amino-acid units. If it were, th widely different physical and chemical properti which are met with in the proteins would have to b explained largely on the basis of their amino-ac content. The differences in composition which the exhibit do not seem to be sufficiently great to warra this assumption. The insolubility of the keratins, f instance, although accounted for in part by the hig proportion of cystin they contain, this being a ver insoluble amino-acid, is possibly also due to th presence of other modes of union of the constituer amino-acids in addition to the amide linkage. Sim larly, the varying degree of liability, the phenomer of denaturation, and the physicochemical behavio of different proteins are difficult to explain solely o a basis of differences in their components. There much still to be learnt about the actual structure the protein molecule.

The investigation of the structure of proteins whi are closely allied in origin, composition, and gener chemical behaviour by immunological and in part b chemical methods has taught us how intricate th mechanism must be by which they are built up. Th facts brought out by the classical work of Dakin an Dale on the albumin of the duck's and hen's eg serve to exemplify this.

The only chemical difference that could be shown betwe these two proteins was concerned with the disposition the molecule of some of the leucin, aspartic acid, an histidin, which resulted in different degrees of racemisati of these amino-acids when the respective albumins we treated with caustic soda. But when used as antigens the anaphylactic reaction they were markedly specif These results indicate that the stereochemical structure the molecule is different in proteins which are very simil both in general chemical properties and in biological orig They suggest that the protein molecule produced by particular type of cell is always built up in a distinctive an so far as we can determine, an unvarying pattern.

We may deduce from this that although the gener method of protein synthesis, that is to say, th mechanism by which amino-acids are joined up, ma be the same in all cells, yet there must be arrang ments in the cell which enable only one particula final pattern, to result from the synthesis.

THE METHODS WHEREBY AMINO-ACIDS COMBINE.

What are the methods by which the amino-aci are caused to combine? Those used by the organ chemist in the synthesis of polypeptides can have n place in the living cell, although they have been great assistance in helping to reveal the gener structure of proteins. The use of proteolytic enzym in an attempt to bring about synthesis under cond tions which have been partially successful with oth substances has often been tried and nearly as ofte has failed. Two examples of protein synthesis b enzyme action have been described. The mo acceptable of these is Taylor's production of a pr tamine by a glycerol extract of clam liver from th products of its complete hydrolysis. But, so far a I am aware, this is an isolated observation whi has not been extended or repeated with other pr tamines. The other is the preparation of so-calle plasteins from the products of the partial hydrolys of certain proteins by pepsin. A comprehensiv review of the subject of plastein formation b Wasteneys and Borsook, who have themselves mad notable contributions to this problem, has led the to the belief that in this phenomenon we have a tru resynthesis of protein from some of the more comple of its hydrolytic products. Their work still leav

many questions regarding protein synthesis nanswered, and not the least difficult of these is the roblem of how the separate amino-acids are brought ogether to form the specific proteose substrates hich one must postulate as combining—and in a efinite order—to produce the particular protein hich is characteristic of the cell which synthesises it. ne of the great difficulties in accounting for the nthesis of protein by a reversal of enzyme action that this synthesis only takes place, so far as we n observe, in a cell which is living.

The process by which the substance of the cell is creased, the building up of protoplasm, is one which ust be closely allied to protein synthesis, since the aterial we call protoplasm is constituted for the eater part of amino-acids, united, so far as can be certained, by the same sort of linkage that we find proteins. The protoplasm of the dead cell responds all the tests by which we identify protein, it is bject to the action of hydrolytic agents in the same ay, and yields identical products when hydrolysed. ught we not therefore to look for some of the echanisms of protein synthesis in the processes nich operate when the living cell grows, and can by any stretch of imagination account for this by reversal of the action of one or more hydrolytic zymes? It appears inconceivably difficult to do . The extreme specificity of the reaction which cessitates that at a given phase of the synthesis e particular amino-acid and that one alone can be ded as the next link in the molecule, requires such multiplicity of enzymes and such a remarkable gree of control of their action as to be almost tside the range of probability. When we remember, lwever, that one of the prime attributes of life is at it is a dynamic condition, it does become possible t form a conception of protein synthesis in relation t that fact. The experiments of Willstätter and ners have shown that to some extent the specificity enzymes is accounted for by the "carrier" with ich they are associated. It is not inconceivable t a catalyst capable of bringing about the union amino-acids in the living cell and ultimately f hioning its protoplasm may be attached to or a ociated with a "carrier" which, instead of having a ixed configuration, as with the enzymes that we e extract from the dead cell, has one which is con- tually varying, this dynamic state being charac- tistic of the living material of the cell.

f, further, we could assume that the variations in ti configuration of the carrier were cyclic, always g ng through a definite series of phases, it might be p sible to account for the fact that at any particular p se of the cycle the configuration would be such a to favour the synthetic union of one particular a ino-acid rather than any other because of its s tial arrangement. The assumption of cyclic c nges in simple or complex living organisms is not n in physiology, and it is not unlikely that they o r in parts even of the cell itself. The phenomena o nitosis are a somewhat gross illustration of such c lic events.

A POSSIBLE MECHANISM OF SPECIFIC PROTEIN PRODUCTION.

s is perhaps difficult to justify speculations of this ki l, but it appears to me that it is at least useful as n intellectual exercise to try to arrive at some co eption, founded on what little experimental ev ence we at present possess, of a possible mechanism wh h would account for the reproduction time after ti of the intricate pattern of the protein of a pa icular type of cell.

Whatever be the mechanism of protein synthesis there is another fact concerning it which is of interest, and that is that the cell to maintain itself must apparently contain a certain concentration of amino-acids. If these are not supplied in the animal's food then the animal supplies them by maintaining its more important tissues at the expense of others. This would suggest that the conditions for nitrogeneous equilibrium which we find in the whole animal have their replica in each cell, but the concentration of amino-acids required to maintain the equilibrium is not the same for all. Hence an amino-acid deficiency such as occurs in protein starvation leads to autolysis of some tissues before others. The equilibrium conditions appear to be set at different levels. The fact that certain amino-acids are more necessary than others in providing for this balance may be partly due to their special importance in the protoplasm of those cells which are the first to break down when protein food is withdrawn or an inadequate protein is fed.

The Site of Protein Synthesis.

The possibility that protein synthesis is associated with some part of the cell which is undergoing cyclic changes, and is thus alive, raises the interesting question of the site of this and possibly other syntheses, such as those of fat and glycogen. Are all parts of the cell—that is to say, both nucleus and protoplasm, to be regarded as alive in the sense I have indicated, and therefore to be considered as regions in which syntheses depending on life can be brought about?

It is necessary not to confuse the terms irritability and life. It is true that what we term irritability is usually taken to imply that the tissue which shows it is living, but taking the nerve-fibre as an example, it would appear that the maintenance, for a time at least, of the irritability of protoplasm and its restoration when it has disappeared—but not irreversibly—does not require the presence of the nucleus. It may require oxygen or the presence of certain ions, but this may merely mean that the labile state of the protoplasm has been upset by the products of the cell's activity, and removal of these will restore it to its irritable condition.

IRRITABILITY AND LIFE.

We have no evidence that irritability as a manifestation of what we call life is more than the possession of extremely labile structures, sensitive to minute environmental changes. The nucleus, on the other hand, is essential to the continuous life of the cell and its growth. It appears also to determine very largely the magnitude of the respiratory processes which occur in it at rest, though not necessarily the excessive respiration observed in the recovery from functional activity. Can we therefore go so far as to say that the nucleus is the seat of those synthetic activities of the cell which appear to depend on its living character rather than on its irritability, or have we to regard the protoplasm as equally living so that it is able to reproduce itself and in addition bring about such syntheses as those of fat and glycogen?

There is something to be said in favour of the idea that the protoplasm is not living in the sense in which the nucleus is, and therefore is less likely to be the seat of certain synthetic processes. It is, I think, quite a tenable view that protoplasm is made up, largely but not entirely, of combinations of amino-acids such as we find in the proteins, and that it is synthesised by the nucleus to serve special as well as certain general requirements. These special requirements must and do vary greatly with each type of cell.

Consider the mammalian erythroblast. The principal substance in its protoplasm is the protein hæmoglobin. It is doubtful whether this cell exists except to produce hæmoglobin. When it has matured the nucleus degenerates and disappears leaving the red blood corpuscle. Along with

this the respiratory activity of the cell practically disappears too, and there is not much discoverable in it except hæmoglobin. It is certainly now not living in the sense in which its progenitor, the erythroblast, was. Is it not reasonable to suggest, therefore, that the production of hæmoglobin as the erythroblast grows and matures is a function of the nucleus and not of the protoplasm of this cell? All semblance of further synthesis of hæmoglobin certainly disappears when the nucleus goes. The adoption of such a view does not imply that having produced the protoplasm of a cell the nucleus has nothing more to do with it. We know that in some indefinable way the nucleus in most cells controls the structure of the protoplasm and maintains its lability, but we have no knowledge as yet of the mechanism by which this is brought about.

In emphasising the great similarity between the growth of protoplasm and the synthesis of proteins, other examples in addition to that of hæmoglobin come to mind. The cells of the Malpighian layer of the epidermis have to produce the protein which eventually becomes the keratin of the *stratum corneum*. This would appear to be one of their chief functions. When it is done the cell dies and the nucleus becomes functionless. The production of collagen by cells of the connective tissue and of milk proteins by the cells of the mammary gland are instances of the continuous synthesis of proteins which are not labile like the protoplasm of, say, the muscle or nerve cell. Their formation, however, may be due to the operation of the same general process. They are certainly non-irritable and non-living. It is difficult to imagine that while in the cell they possess the power of reproduction but lose it once they have been cast out.

NUCLEUS OR PROTOPLASM.

If we accept the possibility that the nucleus of the cell may be the site of protein synthesis it is legitimate to consider whether the substances which appear in the protoplasm as discrete particles or masses such as glycogen or fat are produced in the nucleus or only in the protoplasm. We have no evidence as to this. The fact that they first appear as visible objects in the protoplasm is not evidence that they were produced there, and it has already been pointed out that their synthesis is apparently only possible in cells which are alive. They may be synthesised in the nucleus and stored in the protoplasm. Their disappearance from time to time may be conditioned by the liberation of enzymes from the nucleus to hydrolyse them. Such a view would do away with some of the difficulties which we experience in attempting to explain why substrates may be present in cells which, judged by their behaviour after death, appear to contain enzymes that hydrolyse them. The proto, plasm, instead of producing such reserve materials may serve as a convenient storehouse for them until the appropriate stimulus for their breakdown arrives.

One property of proteins, which may account in a general way for the presence of protein-like structure in protoplasm, is their buffering power. The nucleus is probably the most labile part of the cell. The chemical reactions proceeding in it may demand an environment that has to be finely controlled as regards changes in reaction or the concentration of certain ions. The protoplasm may thus serve as a protective layer between the nucleus and the external world, guarding it from changes which would otherwise terminate its existence. The known properties of the proteins, both chemical and physical, may be useful to this end, to which they are almost ideally suited.

Even if we can accept as possible the unorthodox view that the nucleus is the only living part of the cell, and is therefore the only part that can bring about syntheses which depend upon life, it does not solve our difficulties in explaining how they are achieved. It merely narrows down the possible sites in the cell in which they occur. The nucleus itself is a complex structure, and we have as yet few experimental methods for elucidating it. Most biologists would, I think, agree that the cell has arisen by process of evolution from something simpler ar eventually from non-living materials. It cannot ha come as a "bolt from the blue." If we regard t nucleus as the only living part of the cell, then v may justly regard the protoplasm as something th has been acquired or developed in the process evolution and is now necessary to its existence. W do not know definitely, however, of nuclear materi which is living and devoid of its protoplasmic envelo unless such an arrangement is present in the bacter But the investigation of filtrable viruses has giv an indication that material possessing the prir attribute of life—namely, the power of reproduci itself—exists, possibly in simpler forms than we fi in the smallest visible organisms.

If we agree that the cell has evolved from son thing simpler, then we might expect to find su elementary forms of life coexisting with it did but know how to look for them. The filtral viruses may represent such forms, and their chemi characters may resemble those that we find in t nucleus of the cell. The ability to synthesise prot may be a property which living material only acqui at a late stage of its evolution, and that prope may be one which in the process of time has come be essential for the maintenance of the comp structure of the nucleus as we see it to-day.

DIABETES AS A PHYSIOLOGICAL PROBLEM.*

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LECTURE II.

Regulation of the Secretion of Insulin.

THE internal secretion of insulin must be adjus from time to time according to the needs of organism, and it is probably safe to assume tha greater secretion will be required when preform carbohydrates, rather than protein and fat, are foodstuffs being assimilated. When glands such the salivary become active, definite histolog changes can readily be observed in the cells, such the extrusion into the ductules of the zymo granules which are believed to form the precur of the active constituents of the secretion. In ductless glands, owing to the difficulty of exci them to short bouts of greater activity, sim histological changes are not so readily demonstra Under certain conditions the isles of Langerh as Homans,[84] F. M. Allen,[25] and Bowie[26] h shown, show peculiar changes affecting the gran of the so-called β-cells. These conditions fulfilled by extirpation of all the pancreas exce small graft, which may be transplanted into abdominal wall without disturbing its blood- or ne supply. Because of the removal of most of the i tissue, a great strain is put upon the remai grafted portion to secrete sufficient insulin, an food rich in carbohydrates be given, this st ultimately tells on the islets, so that peculiar cha become visible in their cells, involving a hydr degeneration of the protoplasm. There can

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little doubt that this change is related to the insulin-secretory function of the cells, because it does not occur when the animals are treated with insulin and is much less marked if the diet does not include preformed carbohydrate. Moreover, if insulin be given to an animal in which hydropic degeneration has already started—as revealed by examination of a small portion of tissue removed from the graft—this may disappear and the cells revert to their normal condition (Allen, Bowie, loc. cit.).

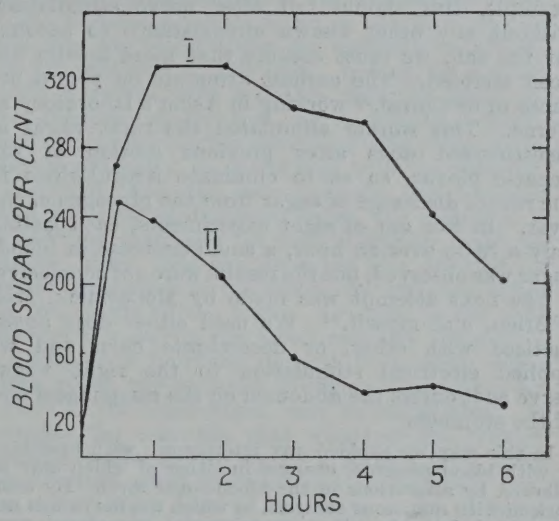
EVIDENCE THAT THE SECRETION OF INSULIN VARIES FROM TIME TO TIME.

Measurement of the changes that occur in the amount of insulin in the blood and tissues cannot be made by methods of extraction, because these are not sufficiently thorough or standardised to be carried out accurately, especially in material such as blood which contains at most only traces of insulin. The available methods for observing changes in the discharge of insulin into the venous blood of the pancreas are indirect. It is a well-established fact that the hyperglycæmia which follows upon the ingestion of sugar is much more marked in laboratory animals (rabbits) which have been deprived of food for some days previously than in recently fed ones (Bang [27]). This is well shown in the curves (Fig. 3) of experiments by Tiitso.[28] After several injections of sugar into starved animals, the hyperglycæmic response also becomes less. Similar results have also been obtained on man, especially by Staub [29] and Traugott,[30] and, as has also been shown by Thalheimer,[31] when successive small amounts of glucose are given by mouth (in man), the blood-sugar, although at first rising after each portion, finally fails to respond. If these results depend on the fact that the internal secretion of insulin is regulated by the amount of carbohydrate entering into metabolism as such, it should be possible to demonstrate that differences in the effects of insulin are dependent upon the state of the carbohydrate metabolism at the time of its injection. This has been found to be the case. For example, insulin causes the blood-sugar to fall more markedly in anmals (rats, rabbits) which up to the time when food was withdrawn before injecting them with insulin, have been kept on carbohydrate-rich food, than in animals which have been deprived of food for several days or have been on a diet poor in carbohydrate (Abderhalden and Wertheimer,[32] Tiitso [33]). Then, again, Staub [34] has made the interesting observation that transfusion into a diabetic patient of 400–500 c.cm. of blood from a healthy person who some time previously had partaken of a meal rich in carbohydrate caused the blood-sugar to fall as if insulin had been injected. When the donor had fasted for 24 hours the transfusion did not affect the blood-sugar level of the diabetic.

There are numerous other characteristics of the effects of insulin which can be adequately explained in terms of the above hypothesis. Thus, following the hyperglycæmia caused by the ingestion of sugar, the blood-sugar falls below the level at which it stood before the sugar was ingested (Folin and Berglund [35]), owing, no doubt, to the fact that the islets become stimulated by the increased concentration of sugar in the blood. There are reasons for believing that this stimulus is more effective when the sugar is absorbed from the alimentary canal than when it is given extraparentally; at least, Eadie, [36] Tiitso, [37] and [38] were never able to observe that the blood-sugar in rabbits fell below its normal level after the hyperglycæmia caused by the intravenous or subcutaneous injection of glucose. Koref and Rigler [39] also state that the blood-sugar ultimately sinks lower in rabbits when they are injected intravenously with insulin and glucose than with the same amount of insulin alone, and corresponding results have been obtained on healthy human subjects by Depisch and Hasenöhrl.[40]

The paradoxical result is, therefore, obtained that following small doses of insulin *plus* glucose a more marked degree of hypoglycæmia becomes developed than after the same amount of insulin alone. Of course, in the former case a temporary rise in blood-sugar precedes the development of hypoglycæmia.

FIG. 3.



I. Blood-sugar curve after administration of 3 g. glucose per kg. body-weight subcutaneously in starved rabbits. Average of nine experiments. II. The same in fed rabbits. Average of ten experiments.

In all the above cases we may imagine that when there is abundance of preformed carbohydrate (free sugar and glycogen) entering the metabolism, the islets of Langerhans are stimulated to produce larger amounts of insulin than usual, and to secrete it more abundantly, in response to temporary increases in the blood-sugar.

NERVE CONTROL OF THE ISLETS.

Granted that increase in blood-sugar stimulates the islets, the question arises as to the mechanism by which it does so. We have here two distinct and separate problems: (1) does the stimulus depend on the increased sugar concentration itself, or on some related substance or on some hormone the internal secretion of which depends on the sugar? and (2), does the stimulus act directly on the islet cells or indirectly through the nervous system? In the latter case we have also to remember that the locus of action might be either the nerve centre from which the insular fibres arise or some afferent receptors acting on this centre. Let us in the first place consider the possibility of direct nerve control. In attacking such a problem, the first question that arises is the anatomical one: do nerve-fibres run directly to the insular cells, and, if so, in which nerve trunk are they carried? An apparently conclusive answer to this question has been given by various histologists. Thus, it has long been known that a rich plexus of myelinated nerve-fibres surrounds each islet, and it has been demonstrated that fine branches from this plexus invade the islets and lie between the columns of cells of which they are composed (Gentes, Pensa).[41]

Non-myelinated fibres have also been described by de Castro as penetrating the islet cells. The peri-insular plexus has been shown to be connected with branches of the right vagus nerve (McCrea and de Castro).[42]

With these facts as an anatomical basis, various attempts have been made to demonstrate that the secretion of insulin is controlled by the vagus nerve. As we have seen, there is no direct chemical method for the accurate measurement of the concentration of insulin in blood, and there is only one indirect method by which the rate of its internal secretion can be approximately gauged, that is, by observing the behaviour of the percentage of blood-sugar. If, for example, this should fall after nerve stimulation, without any other known circumstance to account for the fall, we must assume that more insulin has been secreted. The earliest attempts on record are those of de Corral,[43] working in Asher's laboratory at Berne. This worker stimulated the right vagus in anæsthetised dogs after previous section of the hepatic plexus, so as to eliminate irregularities in the rate of discharge of sugar from the glycogen of the liver. In five out of eight experiments, each lasting only a little over an hour, a small decrease in blood-sugar was observed, but the results were not conclusive.

The next attempt was made by McCormick, Miss O'Brien, and myself.[44] We used either dogs anæsthetised with ether, or decerebrate cats, and we applied electrical stimulation to the right vagus nerve as it enters the abdomen on the œsophageal end of the stomach.

In this way we avoided any interference with breathing or with blood pressure, changes in either of which may be followed by alterations in the blood-sugar level. By comparison with numerous controls, in which the nerve was not stimulated but the other experimental procedures were carried out, we succeeded very definitely in one experiment in demonstrating a prompt fall in blood-sugar during stimulation of the nerve and a more gradual return to normal when it was discontinued. In four other experiments the fall was less decided, and when the stimulation was maintained the blood-sugar either remained depressed, with some irregularities, or returned towards the normal level.

Although we did not consider these experiments as final proof that the secretion of insulin is subject to nerve control through the right vagus, there can be no doubt that they point strongly in this direction.

The problem was then taken up by Britton [45] who, using cats under barbituric acid anæsthesia, stimulated the right vagus on the œsophageal end of the stomach after cutting the branches going to this organ and to the upper intestine. As a rule, the hepatic plexus of nerves was also cut, in order to eliminate the possibility of nervous stimulation of glycogenolysis in the liver, and the left adrenal gland was removed, or its nerve-supply cut, to prevent any possible hypersecretion of epinephrine. Either of these occurrences, by causing hyperglycæmia, might mask any hypoglycæmic effect of vagus stimulation. These operations were performed several hours before the actual experiment, so that their possible disturbing effects on the blood-sugar level might have passed off. In a typical case it was found that immediately after cutting the vagus the blood-sugar rose somewhat and that it fell considerably during stimulation. This was maintained for one to three hours in the various experiments, and after removal of the stimulation the blood-sugar rose again.

The average decrease in the percentage of blood-sugar in a series of 11 experiments in which the hepatic nerves were cut was 18 mg. per hour, and in another series of 6 experiments in which they were intact it was 27 mg. The fall was greater when the level of blood-sugar was high to start with than when it was low, which is also the case when insulin is injected. Further controls were instituted to ensure, first, that the liver contained sufficient glycogen to maintain the blood-sugar level in the absence of nerve stimulation, and, secondly, that dilatation occurring in the pancreatic blood-vessels as a result of the stimulation was not in itself responsible for the hypoglycæmia by causing a more complete removal from the islets of insulin discharged at a constant rate from them. Finally, experiments were performed in which the blood-vessels and nerves of the pancreas were tied before stimulation of the vagus, which then did not affect the blood-sugar level.

The investigation was, therefore, a well-controlled one and the results show decisively that the right vagus nerve contains insulin secretory fibres. They indicate also that these have a tonic influence on the secretion. But although the presence of secretory fibres can be demonstrated under experimental conditions in which the blood-sugar is at a fairly high level before the nerve is stimulated (as in Britton's experiments), this does not necessarily mean that the islets are subject to nerve control when the blood sugar is normal. A similar question arises in connexion with the nervous control of breathing; afferent expiratory fibres can be demonstrated in the vagus nerve under experimental conditions, but it is almost certain that these are not concerned in normal quiet breathing. Impulses to the islets through the vagus nerve may only come into play when control in other ways, such as by hormones, is inadequate to keep the blood-sugar at the normal level, or as an emergency measure.

Further investigation of the problem has, therefore, been undertaken by La Barre and his various collaborators, who have employed the methods of cross circulation between two animals which were first used in 1913 by E. Hédon [46] for demonstration of the presence of insulin in the blood. Hédon transfused the carotid blood of a normal animal into one that was depancreatised and found that this caused a decided, although not a marked, lowering of blood sugar. By anastomosing the vein coming from the head of the pancreas of a large dog with the jugular vein of a small one (both animals being under chloralose anæsthesia), La Barre [47] obtained more striking results, no doubt because there was no dilution of the pancreatic blood by that of the rest of the body. He allowed the blood to transfuse into the smaller animal for periods of half to one hour, until its weight had increased by 100–140 g. When both animals were normal this did not cause any change in the blood-sugar level.

In a further series of observations the thorax of the donor animal was opened under artificial respiration and electrodes were placed on the right vagus nerve after it had been cut below the cardiac branches. Both adrenal glands were also removed, so as to eliminate the possibility of an increased secretion of epinephrine which might mask the effects of insulin. While the pancreatic blood of the animal was being transfused into another one its vagus nerve was stimulated electrically for a period of 15–20 minutes; after separating the animals the blood-sugar of the recipient was found to fall from about 0·115 per cent. to about 0·075 per cent.

So far the results merely corroborate those of ourselves and of Britton, in demonstrating that stimulation of the vagus may cause hypoglycæmia, but the further researches add others of far greater importance since they show that this nerve control is stimulated by an increase in the blood-sugar.

Thus, La Barre found that the intravenous injection of glucose into the donor animal caused the blood-sugar of a previously adrenalectomised recipient to fall by about one-third and to remain at this level for three or four hours although the transfusion of blood only lasted for half an hour. This maintained hypoglycæmia is supposed to have been due to the absence of any compensatory hyperglycæmic effect of epinephrine secretion in the recipient. The result seems clearly to indicate that excess of sugar in the systemic blood increases the insulin concentration

e pancreatic blood, and in the next series of experiments was shown that this depends on excitation of the islets rough the vagus nerves. Thus, it was found that when ese nerves were cut in the thorax of the donor or were ropinised, the injection of sugar did not lower the blood-gar of the recipient (adrenalectomised) dog.

Under the same experimental conditions injection of inephrin into the donor also caused hypoglycæmia in the cipient, but in this case previous vagotomy did not olish the hypoglycæmic effect in the donor (Zunz and Barre), indicating that epinephrine has a direct stimula-ng action on the islets. When insulin hypoglycæmia is induced in a donor upon which adrenalectomy had en performed, transfusion of its blood into a depan-eatised dog did not lower the blood-sugar level. This sult shows that the secretion of insulin is suppressed by poglycæmia, since, as we have seen, the pancreatic vein ood of a normal animal lowers the blood-sugar of a pancreatised recipient.

That it is on the centre of the vagus and not on efferent pathway that the hyperglycæmic blood ts was shown by an experiment in which three gs were used.

Between two of them (A and B) a double carotid jugular astomosis was established and the remaining blood-ssels in the neck of B were ligatured. In this way the ain of B was perfused by the blood of A. The vagus rves of B were left intact and the body of the animal s kept alive by artificial respiration. The pancreatic n of B was then anastomosed with the jugular of the third g, C, and it was found that injection of glucose into A used the blood-sugar of C to fall and to continue depressed several hours after the animal was separated from B.

The results of these amazing experiments would ppear to demonstrate beyond all doubt that the secretory activity of the islets is under control of the agus centre, and that this is stimulated by an increased concentration of glucose in the blood. This erve-control is of importance in connexion with glycogen formation in the muscles. Thus, after glycogen has been removed from the muscles of a nal cat by stimulating them, it will not reap-ear unless excess of insulin is injected. On the other nd, it will reappear in an anæsthetised cat with ain intact without injecting insulin, but will fail to o so if the vagus nerves are cut (especially the left de), or if the pancreas is removed (Debois and bet [48]).

The exact relationship of the vagus to the secretion of insulin is, however, not yet quite clear. G. A. Clark,[49] for example, has adduced evidence to show that, as well as exciting, this nerve may inhibit the secretion of insulin. He found in rabbits that drugs which stimulate the parasympathetic system cause lowering of blood-sugar, but usually fail to do so after section of the right vagus. Clark points out, however, that vagal control of insulin secretion can only come into play under certain circumstances and cannot be essential for maintaining the blood-sugar level, at least in animals leading a placid life in confinement. Thus, shortly after section of the right vagus below the cardiac branches in rabbits the blood-sugar fell immediately, and there was no vification of decreased tolerance following the intra-venous injection of glucose (1 g. per kg.). On the contrary, the blood-sugar curve returned more rapidly to normal, thus suggesting that the injected sugar was being better dealt with than it had been in the same animal before vagotomy. After a period of two months, however, the condition became reversed and the hyperglycæmia following the injec-tion of glucose lasted decidedly longer than usual. The insulin-regulatory fibres in the right vagus would appear from these results to be of two kinds, both inhibitory and secretory; but even if we adopt this hypothesis to explain Clark's results we are left with the problem, why the tolerance for sugar should be actually depressed in two months after the vago-tomy (Clark).[50] It may seem strange that through the self-same nerve there should come to the islets impulses which may either stimulate or inhibit the internal secretion of insulin, but it must be remembered that much the same state of affairs exists in the afferent impulses to the respiratory centre. In view of the results of these various experiments there can be little doubt that the vagus centre exercises some sort of control over the internal secretion of insulin, but it is difficult to estimate its physiological significance.

HORMONE CONTROL OF THE ISLETS.

That nerve control comes into play under certain experimental conditions does not necessarily mean that the variations which occur in the discharge of insulin into the blood under the ordinary conditions of life are regulated in this way. Indeed, on a priori grounds it seems more probable that the islets are under chemical rather than nerve control. Nerve control of glands is highly developed when these have to secrete promptly, as is the case with the salivary, the lacrymal, and the sweat glands, but hormone control becomes predominant when the secretion is only required gradually, as that of insulin must be. Assuming, then, that the islets are also affected by chemical substances in the blood, the question arises as to the nature of the latter. Changes in the concentration of sugar in the blood may act directly on the islets, or a hormone derived from some other ductless gland, the secretion of which is regulated by the state of the blood-sugar, may be responsible. It is possible, for example, that whenever the tension of glucose tends to rise above a certain level some other ductless gland is stimulated to secrete a hormone, which then acts on the islets so as to bring about the secretion of insulin. Speculative hypotheses of this type have from time to time been freely put forward in connexion with carbohydrate metabolism, but there has been little direct evidence to support them, no more indeed than the fact that changes in the blood-sugar level, or in the tolerance for carbohydrate, can be brought about by removing some gland, or by injecting extracts of it. When we bear in mind the extreme complexity of the factors which control carbohydrate metabolism it is evident that such hypotheses are of little value and can serve to stimulate further inquiry provided only that they are based on some firmly established facts.

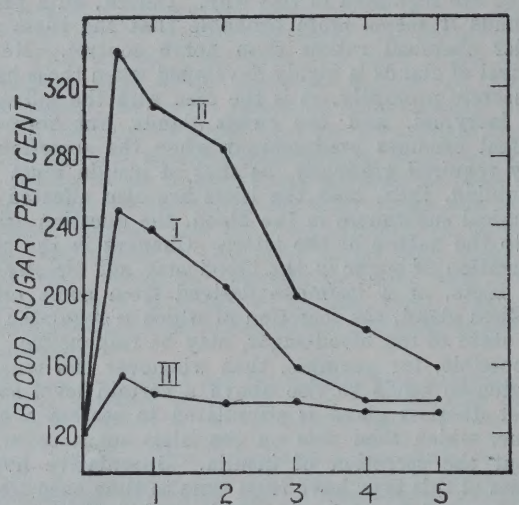
Are there, then, any facts which show that other hormones than insulin have an influence on carbohydrate metabolism and, if so, do they act directly on the various mechanisms concerned in the production or utilisation of sugar, or indirectly by influencing the secretion of insulin from the islets? I will take by way of example the results which have been obtained by various investigators who have experimented with the thyroid gland.

It has been known for some time that the assimilation limit for sugar is significantly altered by thyroidectomy, or by feeding with thyroid (Cramer and Krause,[51] Kuriyama [52]), and that the susceptibility of sheep towards insulin can be made to change by similar treatment (Bodansky [53]). But the results which I wish more particularly to discuss are those obtained by Burn and Marks,[54] who showed that after thyroid gland had been daily added to the food of rabbits for about a week the animals became relatively insensitive towards insulin, so that hypoglycæmic symptoms did not supervene even when they were injected with ten times the usual convulsive dose. At this stage it was also found that the injection of epinephrine resulted in a much greater increase in blood-sugar than usual. These results could most simply be explained as being due to a rapid breakdown of hepatic glycogen, but since this substance was found by actual analysis to be unchanged in amount, it was concluded that its stability had become diminished, so that it was more readily discharged as sugar

into the blood in response to the stimulus, either of a lowered blood-sugar level or of the presence of excess of epinephrine.

After the thyroid feeding had been kept up for two or three weeks, a complete reversal occurred in the response of the animals to insulin and epinephrine; they became hypersensitive to the former and irresponsive to the latter hormone. Confirmatory results were obtained by comparing the extent to which administration of sugar produced hyperglycæmia at various stages of thyroid feeding. For example, in the curves of Fig. 4, which are taken from the work by Tiitso in my laboratory and in which the extent of the rise in blood-sugar is compared in normal rabbits (I.), with that occurring in the same animals after feeding for a week (II.), and for longer periods (III.), with thyroid, there is at first an increase and then a marked decrease in the hyperglycæmic response to sugar. After prolonged thyroid feeding, therefore, the animal becomes extremely sensitive towards insulin injections, whereas epinephrine can scarcely

FIG. 4.



I. Blood-sugar curve following subcutaneous injection in normally fed rabbits. II. The same in rabbits fed for five to six days with thyroid. III. The same in rabbits fed for more than ten days with thyroid.

cause hyperglycæmia, and administration of sugar either fails to affect the blood-sugar level—as in Tiitso's observations—or, as Marks has shown, may actually cause the blood-sugar, after a slight preliminary rise, to fall to the level at which fatal hypoglycæmic symptoms supervene.

How are these results to be explained? The prolonged thyroid feeding is associated with a practical disappearance of glycogen from the liver, but, although this might in itself be considered as adequate to explain the results with insulin and epinephrine, it fails to account for the intense hypoglycæmia which follows sugar administration. There is some probability that Marks's explanation is the correct one—namely, that the administration of sugar causes increased secretion of insulin from the islets. Prolonged administration of thyroid seems, therefore, to bring about two definite changes in carbohydrate metabolism: it renders the liver incapable of forming—or at least of storing—glycogen, and at the same time it greatly sensitises the secretion of insulin. The upset of the glycogenic function is undoubtedly secondary to the excessive secretion of insulin, for, although both Goldblatt [55] and Sahyun and Luck [56] have shown that glycogen accumulates in the liver at early stages after the injection of this hormone in young rabbits, there is abundant evidence to show that its effect is to depress it in other animals.

I have chosen these results as offering the best evidence I know in support of the view that the secretory function of the islets is subject to control by hormones derived from other glands, but ev they are not entirely convincing, for we have to be in mind that thyroxin also has a profound effect metabolism in general. Its calorigenic effect, example, indicates that it alters the metabolic r of the tissues, and it is permissible to suppose th the influence which it has on alimentary hyp glycæmia is dependent upon its causing over-stimu tion of the assimilatory powers of the tissues. W can see, therefore, that the answer to our m question, whether changes in the glucose concent tion of the blood affects the islets directly or directly—either through hormones from other gla or by nervous control—cannot as yet be expected be a final one.

Ætiological Factors Involved in Human Diabetes.

In the light of these experimental results, it m be of interest to examine in a general way the æt logical factors which are believed to be involved human diabetes. Disregarding entirely the inher tendency to the disease and its possible occurrence a result of luetic or other infective lesions involv the islets, it may be stated that there are th conditions which seem clearly to lead to its devel ment—over-eating, obesity, and nerve strain. seems to be accepted by physicians that intempera in eating, especially when coupled with sedent habits, is decidedly predisposing to diabetes, an it is at least possible that this may depend on a c tinued overstraining of the islets. We can imag that the continued call for insulin when carbohydr metabolism is working under high pressure leads a breakdown of the overworked insular cells, a v which has been supported by F. M. Allen's exp ments on partially depancreatised dogs. Gran then, that intemperance in diet may lead to a bre down in the insulin-producing function of the isl the question arises whether the over-stimulation their cells occurs through their nerve control through direct action of some hormone on them. appears to me to be most unlikely that the for could be the mechanism involved, since no condi is known in which persistent over-stimulation nerve-supply brings about degeneration or atro of the organ or tissue concerned. It is much m likely that a humoral mechanism is involved. the other hand, it seems that it must be throug breakdown of the nerve control that the islets c to function inadequately in those cases in which incidence of diabetes is related to conditions of n strain. But it will require much further analysi this relationship to make it certain that these p posed nervous cases do not really belong to dietetic group. An analysis in this direction by Jo has made it at least not impossible that most of cases in which the chief ætiological factor has appe to be a nervous one can be shown to have bee patients who were assimilating food beyond t metabolic requirements.

Methods for Detecting Changes in Insul Secretion in Man.

Intimate association between the experiment and the clinician has been a feature of researc carbohydrate metabolism. Much of the informa revealed by experiments on animals has been invaluable guide in the control of diabetes in and, on the other hand, careful observation of disease by the clinician has frequently indicate the experimentalist the pathway along which should proceed in searching further for the natu

ıe metabolic fault which causes it. Without the utual coöperation of the two groups, it is certain ıat we should not now be in possession of a means y which the diabetic can be relieved of all his mptoms, so that he can follow his usual pursuits ith but little, if any, handicap.

One of the most interesting of the problems which e on the border-line between laboratory and clinic ncerns the control of the secretion of insulin in an; whether this undergoes alterations under rmal conditions and whether such alterations, if ey occur, have any relation to the onset of diabetes. he symptoms by which an increased internal secre-on of insulin may be recognised in man are: (1) tual hypoglycæmia while in the basal state; (2) an cessive fall below the normal level of blood-sugar llowing post-prandial hyperglycæmia; and (3) an cessive difference between the sugar percentages in pillary and venous blood. Spontaneous (idio-thic) hypoglycæmia in man may be suspected hen the basal blood-sugar is found to be lower than 08 per cent. Sometimes it may fall well below the ual convulsive level without the development of y definite symptoms, cases having been reported children in which the percentage of blood-sugar as only 0·038 without anything abnormal being served in their behaviour (Talbot, Shaw, and oriarty [57]). Even when hypoglycæmia is present cannot be regarded as a certain sign of hyper-sulinism, since the blood-sugar may fall far below s usual level in perfectly normal conditions, as after renuous and prolonged muscular exercise. Here e rapid utilisation of the glycogen of the muscles ust be regarded as the primary cause of the hypo-ycæmia, and it is of interest that the ingestion of gar usually gives prompt relief to many of the bjective symptoms of fatigue. The blood-sugar ay also fall to an unusually low level when milk is ing actively secreted both in the depancreatised g and in the milch cow, but Harding and Downs [58] ny that it becomes subnormal in nursing women. ith these reservations, however, we are probably rrect in regarding as indicative of hyperinsulinæmia y condition in which the basal blood-sugar is rsistently below the limits which I have indicated.

It is possible that the second and third methods to hich I have referred are capable of detecting altera-ons in the secretion of insulin in man that would not preciably affect the basal blood-sugar level, and episch and Hasenöhrl [59] have paid attention to this roblem. They consider that the blood-sugar should t fall by more than 20 per cent. below the normal vel after the hyperglycæmia caused by 100 g. of ucose, and that the differences between the percen-ges of sugar in venous and capillary blood in about e hour after beginning to drink the sugar solution 0 per cent. taken slowly during half an hour) should t exceed about 15 per cent. The principles upon hich these methods depend have been established the work of numerous investigators, both experi-ental and clinical, more especially by Frank, othmann, and Wagner.[60] It is claimed for them at they tell us directly whether or not insulin is esent in proper amount, and not merely whether e abnormal reaction to sugar depends on a balanced fect of insulin and other hormones acting on the ycogenic function of the liver. According to episch and Hasenöhrl, deviations from the normal" difference can be detected in non-abetic persons in whom there is a tendency obesity or to excessive leanness. In diabetes elf the difference disappears. It will take con-derable investigation to ascertain whether these methods are really any more dependable than that of the sugar assimilation curve for detecting early stages of diabetes or other pathological disturbances of carbohydrate metabolism.

Hyperinsulinism.

What more particularly interests us is a consideration of the cases in which hyperinsulinism becomes of clinical significance. Although earlier cases have been reported that of Wilder, Allan, Power, and Robertson [61] is the most complete.

Their patient was a surgeon, aged 40, who, in November, 1925, after an unusually long day in the operation theatre, was overtaken by weariness, confusion, and ultimately by collapse, these symptoms being promptly removed by taking an egg-nog. Attributing his condition to hyperinsulinism, the patient found that he could ward off attacks by taking food at frequent intervals. As time passed the tendency to hypoglycæmic symptoms increased and it became necessary for his wife to watch for signs of unusual behaviour while he was asleep, and to give him sugar for their relief. Some time before the onset of these symptoms those of gastric distress and of renal colic had been experienced, and at one time mild diabetes had been diagnosed. In October, 1926, when the patient came under the care of Wilder and his associates, it was found that the symptoms manifested themselves in a little over three hours after the noon-day meal, when the blood-sugar was 0·055 per cent. In four hours they became pronounced, and included perspiration, muscular twitching, and incoherence of speech. The blood-sugar at this stage was 0·036 per cent., and 15 minutes later, when it was 0·027 per cent., the development of stupor and convulsive jerkings made it necessary to give sugar, with the result that in ten minutes recovery was well established. From among the other clinical data, the following are of significance: 1. Administration of either epinephrin or pituitrin did not affect the hypoglycæmic symptoms or delay the fall in blood-sugar. 2. When sugar solution was continuously delivered into the duodenum through a tube, from 20 to 25 g. an hour were required to ward off the symptoms.

On Dec. 4th an abdominal operation revealed a cystic tumour in the tail of the pancreas and a hard nodular one in the right lobe of the liver. A small portion of the normal liver substance was removed and found to contain 3·49 per cent. of glycogen. This is of great physiological importance, since it indicates that the failure of epinephrin to combat the symptoms was not due to an insufficiency of hepatic glycogen, from which this hormone might produce sugar. The post-operative management of the case was difficult and demanded the continuous intravenous injection of glucose for 63 hours, when the nausea disappeared and glucose could be given by mouth. The condition became worse after the operation, so that the daily glucose value of food (sugar *plus* other food) had to be increased to 1000 g. to ward off the hypoglycæmic symptoms. The patient died one month after the operation.

Examination of the tumours removed, within three hours after death, from the pancreas and the liver showed the former to consist of focal masses of tumour cells embedded in a dense connective tissue stroma and arranged in irregular strands and islands. The cells had a striking resemblance to those of the isles of Langerhans, and here and there some of them were degenerating. But the most significant observation was that the neoplasm in the liver was also composed of similar cells. It was identified as a carcinomatous metastasis arising from the island cells, and an extract made from this metastasis showed it to contain a relatively large amount of insulin. Neighbouring portions of healthy liver similarly extracted were found to contain no insulin, but to be loaded with glycogen (8·25 per cent.).

This excellently described case establishes the existence of a hitherto unknown disease, and since its publication others have been described by McClenahan and Morris,[62] by Thalheimer and Murphy,[63] by F. N. Allan,[64] and by Howland, Campbell, Maltby, and Robinson.[65] These are important because they carry us a step further in showing that the hypoglycæmic symptoms may be cured by surgical operation.

Allan's patient, a farmer 52 years of age, had suffered frequently, for about two years before he came under observation, from attacks of weakness and stupor which could at first be warded off by taking food at short intervals. At the time the patient came under observation the blood-

sugar while fasting fell to 0·04 per cent., at which level the usual hypoglycæmic symptoms supervened and, since these could no longer be satisfactorily controlled by taking food, it was decided to operate. No tumour being found in the pancreas, a portion (14 g.) was removed so as to restrict the production of insulin. This apparently resulted, since the hypoglycæmic attacks became much less frequent, three meals a day being as a rule adequate to prevent them.

The case described by Howland et al was a woman, aged 52, in whom convulsions and coma, along with mental symptoms and excessive sweating, had been frequent for six years before admission to hospital. Hypoglycæmia was found, but the most remarkable feature of the case was the erratic response to carbohydrate administration (dysinsulinism). Thus, intravenous injection of glucose solution would remove the coma only temporarily, whereas, when sugar was given by mouth, recovery was satisfactorily maintained and the blood-sugar rose to diabetic levels. Operation was decided upon, and a pancreatic tumour was found, which proved to be a slowly growing carcinoma. It was removed, with the result that the patient—during the 14 weeks which the record covers—remained free from her previous symptoms.

These case-histories are invaluable ready-made experiments, which demonstrate that the islet tissue may proliferate and become hyperactive during adult life. In Allan's case the proliferation was unaccompanied by tumour formation, and this would seem to me to indicate the possibility that excessive variations in insular activity may sometimes be a cause of vague metabolic disturbances in man, particularly of those in which either abnormal corpulence or leanness is the chief symptom. Various clinical observers have had this possibility in mind (cf. Falta [66]), and I would venture to suggest that it should continue to be examined by such methods as I have outlined.

That the islet tissue may vary in amount from time to time opens the question of its derivation, and it is interesting to recall the oft-repeated conclusion of Laguesse [67] that the duct epithelium is not the only structure from which insular cells may be derived, but that the acinar cells may also become transformed into them.

Hypoglycæmia in Diabetes.

The hypoglycæmia we have just been considering differs essentially from that which is not uncommonly met with in diabetic patients. The main cause of the greater susceptibility of the diabetic to insulin is inadequate storage of glycogen in the liver, for although this substance may continue to be formed out of protein and fat, it cannot be stored up sufficiently in the liver to meet the extra demands of the organism for sugar (cf. Joslin [12]) occasioned either by excess of insulin or by increased muscular activity. Muscular fatigue is therefore to be avoided in diabetic patients, although graded exercise is beneficial in that it reduces the requirements for insulin (cf. Gerl and Hofmann [68]). When the demands of the organism for sugar become excessive, as after sustained muscular effort, hypoglycæmia of sufficient degree to cause marked symptoms may supervene even in perfectly normal persons (marathon runners) and the symptoms can be immediately relieved by the ingestion of sugar (Levine, Gordon, and Derick [69]). In epilepsy in children and in progressive muscular dystrophy hypoglycæmia is also said to occur.

Substitutes for Insulin.

The activity of the islets can probably be stimulated by various drugs acting on them either directly or through the nervous system. From a therapeutic standpoint this is of very great importance, since it is obvious that relief could in this way be obtained from the diabetic symptoms but at the risk of causing a further deterioration of the secretory powers of the already overtaxed islet tissue. Among the substances which may act in this way, synthalin, myrtillin, and bile-salts deserve some attention, the first two more especially as having been recommended as substitutes for insulin in the treatment of diabetes. Since whatever effects they may have are manifested when they are given by mouth, much attention has been devoted to seeing whether they really possess any clinical value and might therefore be used in cases in which hypodermic medication is undesirable.

Synthalin is a compound containing two molecules of guanidin along with ten or more of methylene (dodekamethylendiguanidin). It was introduced by Frank, Nothmann, and Wagner,[70] who showed that although guanidin itself lowers the blood-sugar in rabbits, as had previously been known, it does not significantly do so in depancreatised dogs, whereas synthalin acts on both. The hypoglycæmia which synthalin produces is often preceded by hyperglycæmia, this depending on dosage, and also—according to Bodo and Marks [71]—on the glycogen content of the liver. These workers also found that synthalin lowers the sugar in the fluid perfused through the isolated muscles of the leg (in dogs), and raises the respiratory quotient of eviscerated spinal cats. But these results may not be of much significance since lactic acid also accumulates in the blood. Synthalin inhibits the deposition of glycogen in the liver of rabbits after ingestion of sugar (Rubino, Varela, and Collazo [72]) and causes damage to the liver cells, especially on repeated administration (Hornung [73]), Fuentes,[74] Simola [75]). Although Frank, Nothmann, and Wagner [76] state that synthalin in its latest form and in suitable dosage is effective in lowering the blood-sugar and in alleviating the other symptoms of diabetes in depancreatised dogs without causing any liver damage, this has not been the experience of others (Rathery, Kowiilsky, and Gibert [77]) and it therefore signifies but little that the drug may temporarily revive fasting phlorhidzinised dogs that are comatose from acidosis. If it has any effect in diminishing the diabetic symptoms in phlorhidzin poisoning, this can easily be attributed to its stimulating action on the internal secretion of insulin. In face of all these experimental results it is not surprising that synthalin should have proved to be a unsuitable, if not indeed a dangerous, drug to use in the treatment of diabetes in man (Graham and Linder,[78] and Joslin [79]).

It is possible, as Bischoff, Sahyun, and Long [80] have shown, that guanidin compounds having insulin-like effects on normal animals even more pronounced than those of neosynthalin may be discovered, but I do not consider that any of them should be used in the treatment of diabetes in man until it is definitely established, not only that they can remove all the symptoms of this disease in completely depancreatised dogs, but also that they can keep the animals in perfect health for a period which is, at least, much longer than that which Soskin has shown is possible in the case of untreated animals.

What I have said of synthalin applies also to myrtillin, although this drug has the advantage that it does not apparently have a toxic action on the liver. It is, at least, harmless. Myrtillin was prepared by F. M. Allen [81] from the leaves of plants of the myrtle family, it being believed among the Alpine peasantry that infusions of these leaves have antidiabetic properties. Myrtillin has been said to relieve the symptoms of diabetes in partially depancreatised dogs and to prolong their lives, but it has no effect on the blood-sugar level in normal animals nor does it in the slightest degree influence the

mptoms or the course of the diabetes in completely pancreatised dogs, as was shown in my laboratory Toronto by Drs. Chaikoff and Soskin. In the light these laboratory findings I can see no justification r attempting to use myrtillin in the treatment of abetes in man.

The results of bile-salts are not very striking. orsters [82] has shown that 1 g. orally, or 0·5 g. travenously (especially denoxycholalic acid), after ithholding food for 24 hours, may lower the blood-gar in rabbits to about 50 per cent. of the normal. milar results were obtained in dogs, in which the imulating effects of these salts on the pancreatic cretion were also readily demonstrable. On the her hand, no hypoglycæmic effects were obtained y giving bile-salts to diabetic (depancreatised) dogs, that their action is clearly dependent upon stimu-tion of the secretion of insulin by the islets. It is ggestive that both the internal and the external cretions of the pancreas should be stimulated in is way, and there is some evidence that the pan-eatic secretion in man is increased after insulin jections.[83]

The researches which I have just reviewed do not courage the hope that some substitute for insulin, pable of acting by the parenteral pathway, will be scovered, nor does it appear likely that any means ill be found by which insulin itself can be made to splay its action by other methods of administration an injection subcutaneously or intravenously. urlin and Hawley,[84] and Miller,[85] have given much tention to the possibility that the ingestion, either very large amounts of insulin itself or of insulin ssolved in alcohol and contained in keratinised psules, might be efficacious, but the results are not fficiently positive to justify the risk of attempting ch methods in the clinical treatment of diabetes. he difficulty is, of course, that insulin is rapidly stroyed by the digestive ferments. This suggests s close relationship to protein, and it is significant at crystalline insulin, as prepared by Abel [86] and s pupils and by Harington and Scott,[87] possesses any of the characteristics of protein. By hydro-sis of crystalline insulin various amino-acids have en isolated (arginine, histidine, and leucine) and lphur is present in relatively loose combination, t it is not yet certain whether the antidiabetic roperties are dependent upon the molecule as a hole or on some side group—for example, that in hich the sulphur is contained. It is at least signi-cant in this connexion that four different samples crystalline insulin, two of them prepared by Abel's ethod and two by that of Harington and Scott, ould have been found to possess practically the me strength, 23·3 units per mg., when assayed—by mparison with the international standard prepara-on—on both rabbits and mice. Since this value is so reached by the best commercial preparations of sulin, which are amorphous, it does not appear that ystalline preparations do much to reveal the nature insulin. Insulin appears to be as intangible as tamins and enzymes; like these, its activities may epend on some little-understood molecular grouping hich, by contact rather than by actual combination, nders the glucose molecule unstable so that it can ore readily be utilised in metabolism. Carr, Culhane, uller, and Underhill [88] recently obtained significant sults showing that insulin can be completely activated by treatment with ethyl alcohol and ydrochloric acid; the reaction is a reversible one, nce the original potency can be completely restored y treatment with dilute sodium hydroxide. It is ggested that the change undergone by insulin by this treatment is an esterification but, whatever may be its nature, the fact that reversible inactivation occurs opens up interesting possibilities with regard to the behaviour of insulin in the body.

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LUNG PUNCTURE IN ACUTE LOBAR PNEUMONIA.

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Exploratory puncture of the pleural cavity has been employed as an aid to clinical diagnosis for many years, and its value has been well established. Exploratory puncture of the lung substance, on the other hand, has been used but seldom, and its value as a clinical procedure has neither been generally advocated nor established. In 1909, Horder [1] described lung puncture as "a new application of clinical pathology," and showed that in cases of pneumonia, of abscess of the lung, and of bronchiectasis lung puncture could be of the greatest assistance in arriving at a diagnosis. In 1920, Thomas and Parker [2] studied the results of "ante-mortem" lung puncture in an attempt to throw some light on the mechanism of crisis in lobar pneumonia, and showed that the death of the pneumococcus was not the factor which causes or initiates crisis. These results do not concern us at the moment; the point of interest about their work and that of others [3] is that lung puncture was performed in a large number of cases, often many times in the same patient, without any evidence to show that it was either a hazardous procedure or associated with any serious complication.

In the Royal Infirmary, Edinburgh, during the past winter, a number of cases of acute lobar pneumonia have been treated with an antiserum for Types I. and II. pneumococcus. As this serum was expensive and difficult to obtain in large amount, it was essential that its use should be strictly limited, if possible, to cases of infection by these types. Accordingly, an attempt was made to ascertain the type of organism at the earliest opportunity. By the usual means of determining the serological type of pneumococcus in sputum,[4] the necessary information on this point was obtained within 6 to 18 hours after the patient's admission; but in a certain number of cases—most frequently those admitted at an early stage in their illness—no sputum could be obtained for several days, and occasionally not until actually after the crisis. By puncture of the lung substance over the affected lobe it was found that in the majority of such cases a pure culture of pneumococcus could be obtained.

TECHNIQUE OF LUNG PUNCTURE.

The method of puncturing the lung substance is similar to that of pleural puncture. In both cases the site of puncture is determined to a great extent by the physical signs. Generally speaking, where the signs indicate exudate or consolidation, there are chances of obtaining a culture of the organism by puncture over that area. In the clinical examination of 74 patients with acute lobar pneumonia during the past six months, it was noted that lower lobe lesions were present in approximately 90 per cent. of the cases. In each patient on whom lung puncture was performed by the writer, one or other lower lobe was apparently affected at the time of puncture, and the lung substance was entered through the seventh, eighth, or ninth intercostal space posteriorly in the mid-scapular line.

The needle is an ordinary exploratory needle of rather fine bore, about 10 cm. in length, attached to a 20 c.cm. Record syringe with a well-fitting piston. The skin is cleansed in the ordinary way, and local anæsthesia with 2 per cent. novocain is induced at the selected site. The needle is then inserted directly into the lung substance for 8 to 10 cm., and the piston slowly pulled back. As the result of suction one or two drops of blood-stained fluid may occasionally enter the syringe. The needle is now gradually withdrawn and, as the pressure becomes lower, some drops of fluid spurt into the barrel of the syringe. This fluid, which may amount only to one or two drops in the needle, is then mixed with 5 c.cm. of phosphate broth (pH 7·6–7·8), 1 c.cm. of this mixture being immediately injected into the peritoneal cavity of a mouse and the type of organism determined in the usual way.

RESULTS IN PRESENT SERIES.

Lung puncture was performed in 17 cases of acute lobar pneumonia. It was primarily done in patients who had at the time no sputum from which the type of the infecting organism could be determined.

Table I.

Case.	Day of illness on day of admission.	Lung puncture fluid type.	Day of admission when puncture performed.	Sputum type.	Day of illness when sputum obtainable
1	2	I.	2	—	—
2	2	I.	1	I.	4
3	4	—	1	II.	6–7
4	3	I.	1	—	—
5	2	—	1	—	—
6	3	II.	2	II.	4
7	4	I.	2	—	—

Table I. shows a group of seven cases which had no sputum at the time of admission. In five of these a positive culture of pneumococcus was obtained from lung puncture. Two cases yielded no growth of pneumococcus, either by mouse inoculation or by direct culture. Sputum was available at a later date from one of these cases; the other patient had no sputum at any time during the course of his illness and in that case, therefore, the type of pneumococcus was not determined. Of the seven cases three eventually had sputum, and the type of pneumococcus present was found to be the same as that demonstrated by lung puncture. In four cases no sputum was obtained at any time during the course of the illness, and in these cases the type of pneumococcus was determined from lung puncture alone.

Table II.

Case.	Day of illness on day of admission.	Type of pneumococcus. Sputum.	Type of pneumococcus. Lung puncture fluid.	Case.	Day of illness on day of admission.	Type of pneumococcus. Sputum.	Type of pneumococcus. Lung puncture fluid.
8	3	II.	II.	12	6	IV.	—
9	5	I.	I.	13	4	II.	II.
10	5	I.	I.	14	2	I.	—
11	3	II.	II.	15	3	II.	II.

Table II. represents a group of eight cases where sputum was obtainable from the beginning of the illness. Lung puncture was performed to confirm if possible the type of pneumococcus found in the sputum, and in six of the cases the same pneumococcus was isolated by inoculation of a mouse. In the two negative cases no growth of pneumococcus or other organism was obtained from lung puncture; in one case the puncture was completely "dry," but in the other some blood-stained fluid was present in the syringe after puncture.

Case 16 (Table III.), a youth of 23, was admitted on the third day of his illness. From sputum, blood, and lung

puncture fluid a Type II. pneumococcus was obtained. The patient died three days later, and post mortem lung culture also showed a Type II. pneumococcus.

TABLE III.—*Results of Bacteriological Examination of Two Fatal Cases.*

Case.	Day of illness on day of admission.	Type of pneumococcus.			
		Sputum.	Lung puncture fluid (ante-mortem).	Blood culture.	Lung culture (post mortem).
16	3	II.	II.	II.	II.
17	5	I.	I.	I.	I.

Case 17, a woman of 48 years, was admitted on the fifth day of her illness. Similarly, from sputum, blood, and lung puncture, a Type I. pneumococcus was obtained, and at post mortem a Type I. organism was found on lung culture.

A pneumococcus was isolated from the "lung fluid" of 13 out of 17 cases. In each case, in addition to the animal inoculation method, the lung fluid was cultured on blood-agar. In four cases there was no growth; in eight cases a pure culture of pneumococcus was obtained; and in five cases a culture of pneumococcus was found, with an additional growth of staphylococcus. In the four cases where no growth was obtained lung puncture was performed on the first day of admission. The physical signs at that time were not a definite indication of the location of the disease, as is often the case in the first two or three days of a deep-seated pneumonia, and the only clue to the site of the pneumonia in three of the cases was the presence of pain over a particular area of lung. No further puncture was performed in any of these four cases. It may be concluded, therefore, that in these cases the site of puncture did not coincide with a focus in the lung where living pneumococci were present in sufficient numbers to be demonstrated by cultural methods.

The question has arisen from time to time whether the strain of pneumococcus isolated from sputum is identical with the strain responsible for the actual pulmonary lesion, particularly when the sputum strain is a Type IV.—that is, a type which so often occurs as a commensal in the throat. It is only on the rarest occasions that a Type I., II., or III. pneumococcus can be demonstrated in the lung lesion post mortem when during life the only pneumococcus isolated from repeated examinations of the sputum has been a Type IV. The results, therefore, are of interest in showing how the type isolated directly from the lung during life corresponds to that found in the sputum. In the two cases noted in Table III. the pneumococcus isolated from the sputum, lung fluid, and blood during life was found to be similar in type to that demonstrated in the lung substance post mortem, again showing that the type of pneumococcus found in the sputum in acute lobar pneumonia is most probably the same as that causing the lesion.

POSSIBLE DANGERS.

After Horder's description of the procedure in 1909 a certain amount of criticism was evoked, mainly on the ground that the procedure was dangerous. THE LANCET suggested in an editorial[5] that "the occurrence of hæmorrhage from wounding a vessel or an aneurysm of the pulmonary artery" was a disadvantage which had to be taken into account. But even if a vessel of moderate size were punctured by a fine-pointed needle the resultant hæmorrhage would probably be of little clinical or pathological significance. Aneurysm of the pulmonary artery, too, must be of the greatest rarity. In septic pneumonia, infection of a healthy pleura might be a possibility, but in pneumococcus pneumonia it is difficult to see how any further infection of the pleura could possibly occur by its transitory puncture with a well-sterilised and fine-pointed needle. Sudden death caused by reflex inhibition of the cardiac and respiratory centres, due to irritation of the afferent fibres of the vagus, has also been suggested as a real though somewhat rare and uncommon danger.[6] It is improbable, also, that a condition of artificial pneumothorax could be induced, particularly if a fine needle is used, attached to a syringe with a well-fitting piston.

In the present series of cases no complication, direct or indirect, was noticed as a result of lung puncture. At the time of puncture no phenomenon such as increased dyspnœa, troublesome cough, or marked increase in the pulse and respiration-rate was noted. In almost every case pain, either at the time of puncture or after, was negligible. Occasionally short stabbing pain was experienced when the needle penetrated an inflamed and over-irritable pleura, but it was only momentary and of no marked clinical significance. Owing to the fact that puncture was usually performed in a patient too ill to realise exactly what was happening, the psychological factor of expectancy was, in the majority of cases, absent.

CONCLUSIONS.

In cases of acute lobar pneumonia without sputum, or with very little sputum, where for therapeutic reasons it is desirable to know the type of organism as soon as possible, lung puncture may be of value, and in some cases may be the only way to ascertain what type of pneumococcus is present.

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GLANDULAR FEVER.

AN EXPERIMENTAL INVESTIGATION.

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RATHER towards the end of the epidemic of glandular fever that occurred in London in the early months of this year I undertook an experimental investigation of the disease by culture and animal inoculation. The results were of a negative kind, with the exception of the case of one rabbit that was inoculated with the citrated blood of a man suffering from typical glandular fever.

Disease of Rabbits following Inoculation of Human Blood.

This rabbit (CL 320) developed a condition characterised by fever, leucopenia, and anæmia. Fever, between 105° and 106° F., and anæmia with signs of ill-health and wasting, began between the eleventh and twelfth days after inoculation, and lasted until the twenty-second. Thereafter the rabbit became well again and appeared to make a complete recovery. By means of the citrated blood of this rabbit, taken

on the sixteenth day at the height of the fever, this condition was readily transmissible to other rabbits, and has been carried through eight passages, including in all 21 animals that have contracted the disease.

Apart from the first two passages, which showed some unusual features, the course, symptoms, and post-mortem appearances of this disease have been remarkably constant,

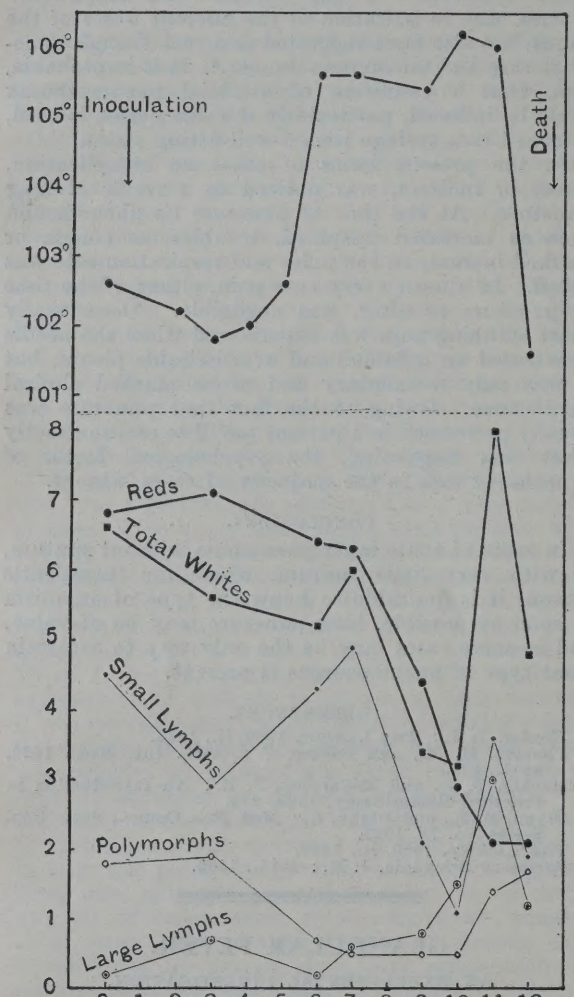

Chart of temperature and blood picture. The ordinates refer to days after inoculation, the abscissæ to total number of cells per c.mm. in millions for red cells and thousands for whites. Large lymphs include monocytes. The upper half gives the temperature in degrees Fahrenheit with the thermometer 6·5 cm. in the rectum.

and are of the following nature: There is, first, an incubation period during which the rabbit seems well, and the temperature remains at its normal level, which may vary in individual cases from about 101°–103° F. During this period the erythrocyte count normally shows a slight increase, while the leucocytes remain fairly steady in both absolute and relative numbers. There follows an abrupt rise of temperature, which in one or two days reaches 105–106·5° F., where it remains some three to six days. During this febrile period the animal swiftly deteriorates, and it becomes thin, weak, apathetic, and short of breath, and looks extremely ill. The red cells fall rapidly to between two and three millions, and there is a leucopenia with an absolute increase of monocytes and, sometimes, of large lymphocytes. The terminal period is ushered in by a rapid fall of temperature to a normal or subnormal level, and the animal dies between the tenth and twelfth days after inoculation. A terminal leucocytosis has once or twice accompanied this period, but leucopenia is the rule.

The most constant features in the symptomatology are the incubation period, the rapid rise and rapid fall of temperature, and the rapid fall of the erythrocyte count. The white cells do not show such constant variations, and for the diagnosis of the experimental disease it has been found that a combined red cell and temperature chart is sufficient. An illustrative chart of temperature and blood picture is given on this page; the actual figures of the blood counts in the table. This chart and table refer to rabbit CL 348 of the fifth passage. The animal was inoculated on July 5th with 7 c.cm. of infected blood by the intravenous route. It presented typical symptoms, and died during the night of July 17th and 18th. At the post-mortem there was the typical enlargement of spleen and liver with focal necrosis but the glands were not enlarged.

Table of Counts made on Blood taken from Ear-vein of Rabbit CL 348.

Date in July, 1930.	Erythrocytes.	Leucocytes.	Polymorphonuclears.	Eosinophils.	Basophils.	Small lymphocytes.	Large lymphocytes.	Monocytes.
	Per c.mm.		Per cent.					
5th ..	6,787,000	6600	25·5	0	2·5	68·5	1·5	1·0
8th ..	7,100,000	5600	29·5	0	4·0	52·5	6·0	8·0
11th ..	6,450,000	5200	12·5	0	2·0	82·5	1·0	3·0
12th ..	6,325,000	6000	7·0	0	1·5	81·5	2·0	8·5
14th ..	4,375,000	3400	12·5	1·5	1·5	61·5	2·0	23·0
15th ..	2,937,000	3200	14·0	0	1·5	35·5	1·5	46·0
16th ..	2,112,000	8000	14·5	0	3·5	44·5	1·0	36·0
17th ..	2,152,000	4800	31·0	0	5·0	39·5	2·5	22·0

POST-MORTEM FINDINGS.

Post mortem in this disease one finds considerable wasting, and there is little fat in the subcutaneous tissues or mesentery. The *peritoneum* contains no excess of fluid and is normal. The *spleen* is greatly enlarged—a typical one measured 7·5×1·9×1 cm. and weighed 6·6 g. The colour is a deep reddish purple, the texture fairly firm. The organ is studded with large numbers of white nodules from pin-head size up to 0·4 cm. diameter. These are rather harder than the pulp, and when a piece of spleen is ground in the mortar the resulting paste is granular, like cod's roe, on account of them. The *liver* is usually enlarged and a pale brown in colour, with well-marked lobular pattern. It is studded throughout with yellowish-white flecks and nodules of irregular shape and size, from pin-head up to 0·4 cm. diameter. The *stomach* is normal, but the rest of the gut varies in appearance. It is sometimes normal, and sometimes shows signs of enteritis. In this connexion it must be noted that an epidemic of diarrhœa was present among the normal stock rabbits throughout this investigation. The other abdominal organs are normal, with the exception of the testicles in male animals, which are frequently very small and may measure only 2·6×0·6×0·7 cm. The *tongue*, *larynx*, *trachea*, *pleuræ*, and *pericardium* are normal. The *lungs* are frequently very pale, collapsed, and œdematous, oozing froth and blood-stained fluid from the cut surface on pressure. Once only were nodules found in them similar to those in the spleen and liver. The *heart* is normal. The *brain* is normal. The *marrow* of the femur is deep red and very soft and friable and can only be peeled out from the cracked bone with difficulty. The *lymphatic glands* are in most

ases enlarged throughout the body, and sometimes how injection. Glands from the groin have measured ·8×0·4×0·3 cm., as against the normal for this ite of 0·5×0·2×0·1 cm. Of the post-mortem findings he enlargement and nodular condition of the liver nd spleen is invariable. The glandular enlargement s less so. The other features are variable.

A detailed investigation of the history of the rgans has yet to be completed, and the findings will e reported later. From what histology has been one it appears that the nodules in the spleen are nassive focal necroses of the pulp, around which here is little reaction. The lymphoid tissue is little ffected, and the organ contains much blood and ppears to be stuffed with red cells. In the liver there re also foci of necrosis, and there is more or less roliferation of the reticulo-endothelial cells around he portal spaces, which are infiltrated with lympho-ytes. The condition of the enlarged glands is nteresting for its resemblance to that of human lands from cases of glandular fever—namely, that here is a proliferation of the reticulum cells and the ells of the lymph sinuses. This is not as marked as n the human glands, and the more acute nature of he disease in rabbits may account for this. In some f the glands there are foci of necrosis surrounded by zone of proliferated reticulum cells.

Attempts to cultivate an organism from the blood nd organs of these rabbits have failed. On six ccasions blood used for passage with a positive result as been cultured by a variety of aerobic methods, nd on five of these it was sterile. On the sixth was btained a Gram-positive spore-bearing bacillus with spreading, dry, arborescent habit of growth on agar —an obvious air contaminant. Organs from 11 cases ave been cultured by aerobic methods, and in the najority of cases have been sterile. Where organisms ave been grown they have either been of an intestinal ype, presumably agonal invaders, or else obvious ir contaminations. No one type of organism has een constantly present. Further attempts to grow he infective agent will be described later.

Nature of the Disease.

The question arises whether this condition (which or convenience and without any pre-judgment of its rue nature will be spoken of as experimental landular fever) is identical with the human disease r whether it is a natural disease of rabbits that was roused by the inoculation of human blood. Two onditions have been described which resemble it nore or less closely: (1) Infection with the *Bacterium nonocytogenes* of E. G. D. Murray, R. A. Webb, and . B. R. Swann [1]; and (2) the natural disease of hares escribed by K. Aoki, S. Kondo, and J. Tazawa,[2] hich is due to a filtrable virus and which is infective or man, rabbits, guinea-pigs, and mice.

1. The presence of a monocytosis, focal necroses in the ver and spleen, and enlargement of the lymph glands are ommon to intravenous injection with *B. monocytogenes* and ith experimental glandular fever blood, but here the esemblance ends. In *B. monocytogenes* infection there is a eucocytosis, the serous cavities almost always contain large amount of exudate, and the subcutaneous tissues are ften œdematous. On the other hand, leucopenia is the ule in experimental glandular fever, and exudates in the erous cavities and œdema of the subcutaneous tissues have ever been seen. Moreover, in the fairly extensive series of ultures made from infective blood and from the organs ost mortem the *B. monocytogenes* has never appeared. t may be taken as improbable that there is any relationship etween the two diseases.

2. The disease described by Aoki, Kondo, and Tazawa auses in man a fever of short duration, followed by painful welling of the lymph glands. In rabbits it produces a high fever which is rapidly fatal, and there are sometimes, but not regularly, enlargement of the spleen and liver, with the presence of submiliary nodules, and swelling of the lymph glands. Nodules were most common, however, in the peritoneum, and were often so numerous as to cause a matting together of the abdominal organs. In experimental glandular fever no case has been seen with nodules in the peritoneum, while they have been constantly present in the liver and spleen. Aoki, Kondo, and Tazawa were able to cause their disease not only with infective blood but also with suspensions of organs, but attempts to do so with experimental glandular fever have so far failed. Spleen has been tried four times, liver twice, and brain once. Aoki, Kondo, and Tazawa do not record the blood picture in their cases nor the histology—at any rate in their German papers. In the absence of these it is difficult to assess the relationship of their disease to experimental glandular fever, but if the two conditions are related they do not seem to be identical.

[1] Jour. Path. and Bact., 1926, xxix., 407.
[2] Centr. bl. f. Bakt., 1928, cv., 252.

There remains the possibility that experimental glandular fever is a natural disease of the rabbit, hitherto undescribed, that was aroused by the intravenous inoculation of human blood. To test this possibility four normal rabbits were inoculated with four normal human bloods. None of these rabbits showed any sign of disease. One, however, died seven days after inoculation from hæmopericardium following cardiac puncture. Of four further normals inoculated with the bloods of the previous rabbits one died, after two days, of enteritis, and there were no signs of experimental glandular fever; another died after three days in similar fashion; the third died after 19 days, also of enteritis, having shown no signs of experimental glandular fever during life or post mortem. The fourth animal remains alive and has been normal throughout. These three unsatisfactory deaths make it imperative that further controls should be done.

It is obviously impossible at present to conclude that the experimental and the human disease are the same. That experimental glandular fever followed the inoculation of the blood of a human case; that it is a disease characterised by fever and by swelling of the lymph glands; that it causes a profound disturbance of the blood picture; and that the histology of the enlarged glands shows features resembling human glands from glandular fever suggest the identity of the two diseases. On the other hand, it must be recognised that experimental glandular fever has been obtained from the blood of only one human case. The bloods of four other cases have been tried without success. Of these cases, however, three were possibly non-infective, since they had been ill some time and were afebrile when the blood was taken. The remaining case was early and febrile. The rabbit that received the blood (CL 321) showed a short period of low fever between 104° and 105° F. for seven days, and aborted on the third day of fever. Coincident with the febrile period there was a slight fall in red and white cells, but the picture was insufficient to suggest at the time an attempt at passage with the blood, and the opportunity was unfortunately missed. The temperature chart and blood picture are now seen to be suggestive of experimental glandular fever.

In order to settle the question of the identity of the human and experimental diseases, blood from further acute cases in the febrile stage is wanted and will be examined when it is available. This investigation and others on the nature of the infective agent, on its viability, cultivation, and filtrability, and on the histological features of the disease will be reported in subsequent papers.

Summary.

1. Inoculation of the blood from a human case of glandular fever into a rabbit was followed by a disease which is transmissible to other rabbits by the

citrated blood. 2. This disease is characterised by fever, anæmia, leucopenia, and monocytosis, enlargement of the lymph glands, spleen, and liver, and the production of focal necroses in them. 3. The relationship of this disease to human glandular fever is discussed. 4. The name "experimental glandular fever" is suggested for the disease in rabbits.

My thanks are due to Dr. S. P. Bedson for his advice throughout this investigation, and to my clinical colleagues for access to their cases.

CLINICAL AND LABORATORY NOTES

AN APPARATUS DESIGNED TO DIMINISH THE INCIDENCE OF POST-OPERATIVE THROMBOSIS.

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In The Lancet of July 12th appears a short article by Dr. C. A. J. Quant (Holland) entitled the Prevention of Thrombosis. Dr. Quant lays stress upon the "slowing of the blood stream as one of the most important of the possible causes of coagulation," and also indicates that the lower abdomen (especially the left side) is probably the usual site of the thrombosis. In recent years Waltman Waters, of the Mayo Clinic, has written on the subject of fatal pulmonary embolism, and in *Surgery, Gynecology, and Obstetrics*, January, 1930, will be found a modern summary of the methods of reducing its incidence. Dr. Waters states that at the Mayo Clinic the average incidence of fatal post-operative embolism from 1917 to 1927 was 0·34 per cent. The result of "the use of a regimen directed towards increasing the rate of metabolism, of blood pressure, and of blood flow in 4500 major surgical procedures of comparable type (to those of 1917 to 1927) during the last 4½ years has been followed by an incidence of fatal pulmonary embolism in less than 0·09 per cent. of cases." This is indeed a wonderful record and it is of interest to recall the means adopted.

Eliminating the bad risks which, of course, can be and will be guarded against, the method in use at the Mayo Clinic appears to be: 1. The decrease of metabolism and of blood pressure and the slowing of the circulation are combated by giving tablets of desiccated thyroid gland grs. 2 three times a day. 2. Patients are urged to move in bed, flex arms and legs, and especially to turn themselves from side to side (Wilson-Pool).

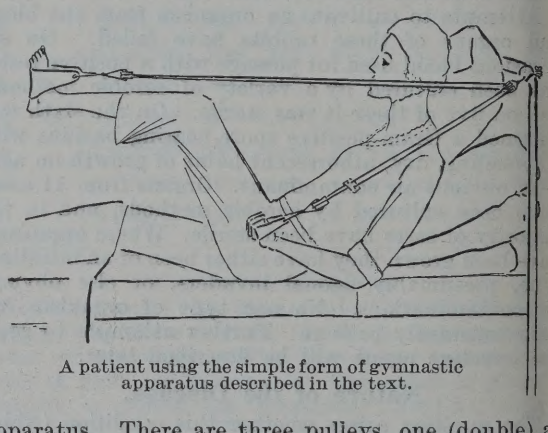
In a discussion following the presentation of Waters's paper Dr. Miller, of Chicago, stressed certain additional points: (1) careful pre-operative study, especially in old people, and the administration of digitalis as a cardiac stimulant; (2) careful operative technique; (3) particular attention to the fluid intake; (4) avoidance of tight bandages, especially near the chest; (5) systematic exercises, and especially daily elevation of the foot of the bed.

Dr. David, of Chicago, commented on the apparent increase in the frequency of the condition; in America it appears to vary from 1 to 3 in 1000 cases, and in Germany there has been an extraordinary increase during the last seven years. Has such an increase occurred in this country? It is very difficult to get any statistics from hospitals, because the cause of mortality is rarely given. My own impression is that there has certainly been an increase in private practice, probably entirely due to the "perfection" of modern nursing. I do not think the catastrophe ever occurred so frequently in hospital, where patients had to "fend for" themselves, and I do not think it is anything like so frequent now.

POST-OPERATIVE EXERCISE.

I have tried the thyroid treatment for the last two years, and regretfully say I have still had catastrophes. For many years I have advocated almost an "ambulatory" post-operative regimen—particularly in prostate cases—and I have been very pleased with it, both for the early closure of the wound and for freedom from thrombosis. One cannot, however, apply the "ambulatory" treatment to a gall-bladder or a stomach case, or after a big lower abdominal operation.

During the last 18 months I have been using in my private practice a very simple form of gymnastic



A patient using the simple form of gymnastic apparatus described in the text.

apparatus. There are three pulleys, one (double) at the head and one each (single) at foot and hand. The apparatus is fixed to the head rail of the bed and is used first on one side and then on the other. A light cord is treaded through the pulleys as shown in the sketch, and there is a means of lengthening or shortening the length of the cord. The stirrup and handle are of soft, well-padded canvas. We use it for all abdominal operations, beginning as a rule on the fourth day. Some patients will try it earlier and others cannot and will not use it until later; some will not use it at all. At the beginning the patient can only exercise for about two minutes, but the time soon arrives when they are able to work the apparatus for five minutes at each side. In some cases they enjoy the exercise very much indeed, and will ask for it and work it for longer periods. The idea underlying the exercises is to prevent stagnation of blood, especially in the pelvis and lower abdomen. By pushing with the hand the leg is pulled well up to the abdomen and at the same time very good exercise is given to the arm. In practice it is found that the patient is best in the position shown in the sketch, and under these conditions there appears to be little if any painful drag on the abdominal wound. We find people who have assiduously carried out these daily "jerks" are not only happier for it whilst in bed but that when the time arrives to get up they are much more able to move about.

The apparatus is designed to "force" a patient into systematic activity at an early stage in recovery. It is to simulate the enforced movements which must be made in a hospital—to negative, if you will, the bodily comfort so ably dispensed in modern nursing. Done under the guise of "physical jerks" the exercises offer a very considerable temptation to most of our patients, and particularly to that class who need it most. The apparatus is made for me by Chas. F. Thackray, of Park-street, Leeds.

PURPURA SIMULATING THE ACUTE ABDOMEN.

By Ian Fraser, M.B., M.Ch. Belf., F.R.C.S. Eng. and Irel.,

ASSISTANT SURGEON, BELFAST HOSPITAL FOR SICK CHILDREN.

Purpura has always been recognised as a disease by which a reputation could be made or marred. The text-books stress the point, and probably every surgeon who has opened many children's abdomens has at some time fallen into the trap. For two cases of purpura to occur within a week or so of each other in the same hospital, and for both to be operated upon, is, I think, sufficiently interesting (or distressing) to merit publication.

Case 1, a small boy, between 8 and 9 years old, was brought to hospital with a 12-hour history of abdominal colicky pain, intermittent in character, with the passage of blood. No tumour was palpable by abdominal examination. He had vomited several times, his pulse had mounted, and his temperature was subnormal. By artificial light his body appeared, without intimate inspection, to be normal. On rectal examination the finger was found to be covered with blood; considering his age, the history, the temperature, the presence of vomiting, and the rectal findings—notwithstanding the absence of the sausage tumour and the *signe de Dance*—a diagnosis of intussusception was made with confidence. Mr. H. P. Hall operated; free fluid was found in the peritoneal cavity, and the gut wall and mesentery were studded with petechial hæmorrhages and ecchymosed patches. The appendix was removed and the wound closed in layers without drainage. The child made an uneventful recovery and convalescence. Careful examination later revealed many minute small hæmorrhagic points which had escaped notice with artificial light. These pin-point hæmorrhages were more marked during the convalescent period.

Case 2 was equally interesting, especially as it followed closely on the first case, which had made everyone on the alert for the possibility of purpura. The patient, a little girl of 12, was admitted in the late afternoon with a history of having been taken ill two and a half days previously with generalised abdominal pain, followed some hours later by vomiting; for the last 24 hours the pain had been in the right iliac fossa. On examination by artificial light her pulse-rate was 120, her temperature 97° F., her tongue was dry and coated, and her breath foul. The abdomen was tender all over, especially over the appendix, and definitely rigid over McBurney's point. The chest and heart were normal. A rectal examination revealed a tender mass in the cæcal region. She thought she felt more comfortable since the morning; this ease had come on fairly rapidly. The only item of interest was that she thought her left foot and right wrist had swollen the last day or two, but there was nothing gross to be seen in them. Her urine was normal.

The diagnosis of acute gangrenous appendicitis was made, and I was rather inclined to think that it had perforated, considering the facts that she had become very much easier, that the pulse-rate had risen and temperature fallen, and also that the tongue was very dry and furred. She had been ill two and a half days, and was now rigid.

A muscle-splitting gridiron incision was made in the right iliac fossa under chloroform and ether. A large quantity of non-purulent blood-stained fluid escaped. The last two feet of the ileum were brilliant scarlet in colour and showed numerous small black areas of hæmorrhage. The gut wall was markedly thickened with the blood contained in the tissues, a condition which, I suppose, explained the mass felt per rectum. The hæmorrhage stopped more or less abruptly at the ileocæcal valve, leaving the cæcum almost normal. The appendix—perfectly harmless and beyond reproach—was removed. It was normal in every respect except that it contained a rich supply of thread-worms. The rest of the ileum was mottled, the mottling gradually decreasing towards the jejunum. There were several enlarged mesenteric glands, some soft and others calcified. An examination of the abdominal viscera through this limited incision failed to reveal any further pathology. The abdomen was closed in layers, with a small wick drain to allow the blood-stained fluid to escape.

Recovery was complete and convalescence normal, except for the following incidents. For three or four days after the operation the motions were mixed with dark blood, and on the third day the urine was heavily tinged with blood. The post-anæsthetic vomit contained blood and the saline returned after operation was also tinged. On about the tenth day she had a severe attack of epistaxis, and about the same time a marked purpuric rash appeared, involving both feet and the outer sides of the ankles. This was so severe that the feet were almost blue. There was also considerable swelling of the ankles.

A blood examination made after the operation was as follows: Blood film—marked preponderance of mononuclear cells. Differential count: mononuclears 35 per cent.; large lymphocytes, 22 per cent.; small lymphocytes, 8 per cent.; polymorphonuclear leucocytes, 35 per cent. Coagulation time, five minutes. Blood-platelets, 114,000 per c.mm. Red blood cells, 5,500,000. White blood cells, 16,500.

These two cases are of interest, in that the internal manifestations were well marked while outward signs were absent or slight. That two such cases should occur within such a short time is worthy of note, and that both should be operated upon merely lends support to the fact that purpura can simulate the acute abdomen very closely. In the two examples quoted it will be seen that the main external diagnostic signs of purpura were well marked after the operation, although almost absent before.

Although both children were operated upon at a time when they certainly had a tendency to bleed, there were no troubles of any sort with wound-oozing or hæmatoma formation. Both wounds healed well; the second showed a slight keloid formation.

TRIKETOHYDRINDENEHYDRATE

AS A REAGENT FOR ALBUMIN, PEPTONE, AND AMINO-ACIDS.

By Hermann Gardner, D.Sc.,

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During an investigation involving the application of tests for proteins and amino-acids, I used a reagent discovered by Ruhemann and advocated in text-books,[1] which has found some usage in clinical laboratories—namely, triketohydrindenehydrate, or ninhydrin. It was noticed that, whilst ninhydrin gave positive indications, no confirmation could be obtained with Millon's reagent or by the biuret or xanthoproteic reactions, nor could amino-acids be isolated by acidulation and esterification in the usual manner. Baumann and Schotten's reaction also failed to reveal the presence of amines. This apparently paradoxical behaviour seemed only to be explicable on the assumption that the ninhydrin reaction was produceable by other than the products of hydrolysis of proteins.

A series of experiments was conducted with dilute ammonium salts in feebly alkaline solution (0·2 to 0·4 per cent. NH_4NO_3 or $(NH_4)_2SO_4$ and 0·04 to 0·1 per cent. $NaHCO_3$). Attention was arrested by the colour reaction these solutions afforded with ninhydrin, mostly a purplish red, which gave the distinctive blue on the cautious addition of very dilute hydrochloric acid. Reference to the published monographs of Harding and Warneford,[2] and of Harding

and MacLean,[3] confirmed the observation to a certain extent—namely, that "all ammonium salts *under the right conditions* are capable of giving the ninhydrin reaction. These conditions *appear* to be a faint alkalinity of the solution." (The italics are mine.)

Actually, alkalinity tends to produce a magenta or purplish red coloration rather than the typical blue, which only appears, as stated, on nearly neutralising the solution. Free ammonia in some amount appears to interfere with the reaction. It seems as if the colorations noted result from ammonium hydroxide in too great amount (although actually but small in proportion) masking the true (or blue) colour resulting from the interaction of NH_3 ions and the reagent. That the interaction is due to ammonia in the ionised state is indicated by the fact that an ammonium salt in very dilute solution will not react with ninhydrin even on boiling, but if a trace of sodium carbonate be added, the blue colour is produced on the addition of the reagent.

An ammonium salt in solution in the presence of alkali, in however small a quantity, indubitably undergoes partial—if but minute—decomposition, and the extreme dilution of itself tends towards ionisation.

If the hypothesis advanced is correct, obviously the presence of ammonia (NH_3) itself in minute amount in an aqueous medium should yield the distinctive reaction. Numerous solutions were prepared and tested, commencing with 0·5 c.cm. of ammonia solution (sp. grav. 0·888 at 15° C.) in 500 c.cm. of ammonia-free distilled water. This gave a claret-red solution on boiling with 1·0 per cent. ninhydrin, the fine blue colour associated with the test developing on the careful addition of N/100 hydrochloric acid. That the coloration was not due to ammonium chloride per se was subsequently proved.

Ultimately it was found that a dilution of 0·15 to 0·2 c.cm. of ammonia solution (sp. gr. 0·888) in 500 c.cm. reacted perfectly to the test—namely, 3 c.cm. of this dilution mixed with 1 c.cm. of 1 per cent. ninhydrin solution, boiled for two minutes, diluted with an equal quantity of distilled water and observed in a white glass tube of 8 mm. diameter by transmitted light, or against a white tile, exhibits the characteristic ninhydrin blue coloration. That is to say, water containing 0·00865 per cent. NH_3, or in 1 c.cm. 0·77 mg. NH_3 nitrogen, responds to the reaction.

SUMMARY.

Triketohydrindenehydrate is not a reliable reagent for the products of hydrolysis of protein generally. The colour reaction is almost certainly due to the presence of traces of free ammonia, or of NH_3 ions, and is masked by ammonium hydroxide (NH_4OH) or by alkali in excess.

Traces of alkali merely promote the reaction through causing the liberation of NH_3 ions from an ammonium salt. No doubt such ions appear amongst the hydrolysis products of protein in the presence of water, hence the reaction.

Ninhydrin, unlike Nessler's solution, is unaffected by ammonium salts in solution.

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2. Harding, V. J., and Warneford, F. H. S.: Jour. Biol. Chem. 1916, xxv., 317.
3. Harding, V. J., and Maclean, M.: Ibid., p. 339.

REVIEWS AND NOTICES OF BOOKS

A Text-Book of Hygiene.

By J. R. CURRIE, M.D. Glasg., D.P.H., M.R.C.P. Edin., Professor of Public Health in the University of Glasgow. Edinburgh: E. and S. Livingstone. 1930. Pp. 844. 27*s*.

A Synopsis of Hygiene.

Third edition. By W. WILSON JAMESON, M.D., M.R.C.P., D.P.H., Barrister-at-Law, Professor of Public Health, London University; and G. S. PARKINSON, D.S.O., M.R.C.S., L.R.C.P., D.P.H., Assistant Director of Public Health Division, London School of Hygiene and Tropical Medicine. London: J. and A. Churchill. 1930. Pp. 541. 18*s*.

Prof. Currie's new text-book is intended for medical students engaged in studying hygiene, but is also meant to be of service to candidates for the diploma in public health. In the range of subjects dealt with it should more than satisfy the present requirements of any examining body for a medical qualification, and will go a long way towards meeting the more detailed wants of the post-graduate student. The sections on air and ventilation, warming and lighting, soil, water-supply, refuse, and sewage disposal are well written and free from many of the obsolete notions which too often make their appearance even in first editions. The question of river pollution is well reviewed and the events which have led up to the present unsatisfactory position are briefly summarised. The public health law (both English and Scottish) is described fully in each section, an arrangement which is convenient for the student. A short summary of the Local Government Acts of 1929 for both countries is also included. The chapter on epidemiology is comprehensive, noting the main theories of the epidemic which have been put forward since the time of Hippocrates, and including a reference to the modern experimental work of Topley and Greenwood.

There are certain omissions and defects which deserve comment. No reference is made either to the dangers of polluted swimming baths or to the practice of continuous filtration which has now been so widely adopted in public bathing installations. The sections dealing with maternity and child welfare and school hygiene are disappointing. Amongst the subjects requiring more detailed consideration are nursery schools, the duties of health visitors, and the provision for physical and mental defect in school-children. Except for a passing note the important subject of mental hygiene is ignored. A bibliography might have been useful, especially since some dogmatic statements made are not in accordance with accepted teaching. The standard of allowable respiratory impurity set out differs from that of de Chaumont, and a rather sweeping assumption concerning the capacity of crevices and chinks as air inlets is put forward. No authority is quoted for the estimate of 3 per cent. as the incidence of chronic carriers of amœbic dysentery in the United Kingdom. Generally, as in most text-books of hygiene, even those purporting to be modern, there is too much bias on the environmental hygiene side compared with the manifold problems of individual hygiene which

o-day form so large a part of the work of a public ealth department.

In many other respects the book is well up to date, eferences to psittacosis, undulant fever, post-vaccinal ncephalitis, the serum treatment of anterior polio-nyelitis and measles are included. The subject of tatistics is adequately dealt with, and the review of tatistical methods should be sufficient for candidates or degrees or diplomas in public health.

The new edition of the popular synopsis of hygiene, n the preparation of which Lieut.-Colonel Parkinson akes the place of Mr. F. W. Marchant as Prof. ameson's collaborator, includes reference to the more utstanding changes in public health administration hich have taken place since the appearance of the econd edition. Of these, the most important and ar-reaching is, of course, the Local Government Act, he main provisions of which are briefly set out. The ecommendations of the Ministry of Health Committee n Vaccination and the provisions of the Vaccination rder, 1929, are also noted and the instructions to accinators contained in the first schedule of the rder are given in detail. The provisions of the ood and Drugs (Adulteration) Act, 1928, are well ummarised. The whole work bears evidence of being horoughly revised and brought up to date. The uthors do not claim that the book is anything but a ynopsis, but the reader will find that it is also a very seful index to modern public health literature. The ection on vitamins is an admirable résumé of the resent position. The chapter dealing with vital tatistics has been rewritten and is one of the best in he book.

Treatment of Children's Disease.

By Prof. F. LUST (Karlsruhe). Translation of Sixth edition with additions by SANDOR A. LEVINSOHN, M.D. (Paterson, N.J.). London: J. B. Lippincott Company. 1930. Pp. 513. 30*s*.

ALTHOUGH text-books of pædiatrics are numerous, rprisingly few are devoted exclusively to treatment. rof. Lust's work has proved its popularity on the ontinent. This volume is something more than a anslation of the sixth (German) edition, since it has een supplemented by additions made by the author, presenting the advances of the last three years, and so by the translator, introducing modifications in ccordance with current American practice. The rst half of the book deals with individual diseases, short diagnostic summary being followed by an count of the management and treatment of each sorder. The second part, arranged in alphabetical der, is devoted to drugs and formulæ, including reparations used in infant feeding. Close printing d a condensed style have made the volume more mprehensive than its size suggests, and it should of considerable service to practitioners.

iagnosis and Treatment of Heart Disease.

Practical Points for Students and Practitioners. Sixth edition. By E. M. BROCKBANK, M.D. Vict., F.R.C.P., Hon. Consulting Physician, Royal Infirmary, Manchester. London: H. K. Lewis and Co., Ltd. 1930. Pp. 240. 7*s*. 6*d*.

THIS little book is full of useful information. In dition to the usual subject matter found in volumes heart disease, many practical points of real clinical portance are included. For example, in discussing e cardiac impulse and the apex-beat the author ys, "remember the extension outwards of the pulse of a nervous rapid normal heart." He advises that three blood-pressure readings should be taken on every patient, since the first inflation of the armlet is liable to induce some spasm in the artery, especially in apprehensive subjects with quick pulses, leading to too high a reading; many other examples of a similar kind could be given. On the vexed question of the significance of the systolic murmur Dr. Brockbank would have us believe that whenever this is found to be present it is evidence of mitral regurgitation due either to disease of the valves or dilatation of the valve ring; in this his teaching differs from that now widely accepted, that a murmur which is found alike in health and disease cannot have the same significance in every case. The chapter on the heart in school-children is a valuable one; it is good to see stated a fact which is so seldom realised—that the impulse of the contraction of the left ventricle in children below puberty can be outside the nipple line. Equally useful is the chapter on examination for life insurance; the advice to listen to a doubtful heart with the patient lying down as well as standing could usefully be followed in all examinations of the heart. The main criticism to be levelled against this book is that insufficient space is given to important recent developments in diagnosis and treatment of cardiac disease. For example, coronary thrombosis is not given the notice it deserves, and only a scanty paragraph is devoted to the use of the X rays in diagnosis. Dr. Brockbank has, however, offered innumerable practical hints of great value.

Medical Science for All: Man v. Microbes.

By NICHOLAS KOPELOFF. New York: Knopf. 1930. Pp. 319. With 130 figures. 21*s*.

THIS attempt to popularise microbiology is not a great success. It has the worst fault of popular scientific exposition in being ecstatic and exaggerated. The title itself is misleading, for man actually gains much more by the kindly offices of some microbes than he loses by the attacks of others. The first sentence of the preface—"a man is only what his microbes make him"—is nonsense. The book is, moreover, unsound in detail. "Galloping consumption" (p. 105) is not general miliary tuberculosis; oysters (p. 121) do not "float" in sewage when being fattened; de Morgan (p. 197) did not initiate the rhyme about "great fleas have lesser fleas" which dates back at least as far as Jonathan Swift; the precise statements on p. 202 of the minimal fatal doses of toxins for man have no justification; and on p. 176 there is a complete muddle about *Leptospira icterohæmorrhagiæ* and the state of knowledge of the causation of yellow fever at the time of Noguchi's death. In short, the layman who wants to know something about bacteriology will find sounder information at less cost in the Home University Library.

Études sur les maladies familiales nerveuses et dystrophiques.

By O. CROUZON, Physician to the Salpêtrière. Paris: Masson et Cie. 1930. Pp. 385. Fr.55.

COLLECTED into a convenient volume the reader will find a valuable series of papers written during a period of years by Dr. O. Crouzon, all of which bear on questions of familial, in distinction to hereditary, nervous and dystrophic disease. They range widely over the whole field and include both the banalities and the rarities. The intrinsic value of some is considerable; for example, the articles dealing with cleidocranial dysostosis and craniofacial dysostosis

are highly informative, as well as being excellently illustrated, and the same may be said of those devoted to familial ocular affections. Here the neurologist will discover unfamiliar facts of much interest. Similar minute and clear description characterises other chapters concerned with cerebellar atrophies, lenticular degeneration, Friedreich's disease, and myoclonus epilepsy. When, however, the reader seeks instruction beyond the plane of clinical medicine he early becomes conscious of our limitation of knowledge. Dr. Crouzon has endeavoured to work out the application of Mendelian principles to familial disease, collecting from personal observation and the literature the records of numerous families in which disease has appeared on a larger or smaller scale; and in most instances he is compelled to state that the paucity of data prevents definite conclusions from being drawn. He considers, none the less, that in Huntington's chorea, cerebellar heredoataxia, and hypertrophic neuritis Mendelian proportions are observed, and he asserts that they are likely to be found present also in Thomsen's disease, Friedreich's disease, familial tremor, retinitis pigmentosa, familial nystagmus, and periodic family paralysis.

Annals of Roentgenology: The Neck.

Vol. IX. By PERCY D. HAY, Jnr., M.D. New York: Paul B. Hoeber. 1930. Pp. 104. $8.

IT is usual in radiological studies to take an organ or a system and work out the radiology applicable to it. Dr. Hay's method of taking an anatomical region, comprising parts of many systems, is unusual if not unique. It certainly has advantages. The author has worked in a department that serves Dr. Chevalier Jackson's bronchoscopic clinic. This service calls for the utmost detail in the radiological examination of the neck, lest some unsuspected foreign body or pathological lesion should be present, and the number and variety of conditions met with are astonishing. Dr. Henry K. Pancoast, in an introduction, points out that the perusal of Dr. Hay's manuscript brought home to him and his fellow workers the importance of a careful study of the neck of every child submitted to examination for suspected enlargement of the thymus gland—a condition which would appear to be much more common in North America than in this country. The author devotes a special section to the examination of the neck in suspected thymus cases, since high respiration disturbance may be due to non-opaque foreign bodies in the trachea, diphtheria, intratracheal or intra-œsophageal abscess, which must all be excluded before the thymus is incriminated.

The atlas is based on a detailed study of 203 cases, 128 of which were pathological, the remainder being normal children and adults. Fourteen different pathological conditions were met with in the series and these are fully described. The radiography of infants is always difficult and, since dyspnœa is present in so many of the conditions illustrated, to obtain any radiographic result at all is a feat of management and skill. When we think of the difficulties that must have been encountered Dr. Hay deserves praise for his achievement in collecting such a representative series; the radiograms illustrating the various lesions in adults, particularly the stenotic conditions, are exceedingly good.

Although this volume is smaller in scope than its companions it is worthy in every way to take its place in this excellent series of monographic atlases.

INTERNATIONAL CONGRESS OF PÆDIATRICS.

STOCKHOLM, AUGUST 18TH–21ST.

(FROM OUR OWN CORRESPONDENT.)

SOME 600 specialists, representative of countrie from America to Japan, attended this Congress, th proceedings of which are to be fully reported in special volume of the *Acta* (*Scandinavica*) *Pædiatrica* which will contain abstracts in English, French, an German. The organisation of the Congress wa admirable, and its success was principally due to th industry and courtesy of the Swedish National Com mittee, whose president was Dr. I. Jundell, an secretary Dr. Nils Malmberg.

Biological Effects of Irradiation.

It may perhaps surprise English practitioners, wh regard rickets as no longer a common disease, tha over a third of the time of the Congress was devote to a discussion on the biological effect of direct an indirect ultra-violet irradiation, with particular regar to rickets. Alfred F. Hess (New York) opene with a paper on the indication for these therapeuti radiations, emphasising their importance in ricket tetany, and osteomalacia. They were of possibl value in dental caries, but in other conditions—fc example, coryza and respiratory affections—he hel them of no avail and possibly harmful. He dre attention to the importance of using an accuratel standardised preparation of ergosterol, especially i experimental work upon the subject. In the discussio which followed the methods of standardisation wer criticised on the ground that rickets in rats could no be compared closely with rickets in man. It wa suggested that the use of a radiation, screened to giv a short band of the spectrum, would produce a pure brand of ergosterol. Faber and Bloch (Copenhage emphasised the distinction between hypocalcæmi rickets, associated with tetany and osteoporosis, an hypophosphatæmic rickets with marked bony ove growth and deformity. H. J. Gerstenberger (Clevelan considered that the high-phosphorus low-calciu form of rickets was becoming commoner owing t insufficient protection.

The Thymo-lymphatic System.

The general facts concerning the metabolism c calcium and phosphorus and their clinical significanc were, apart from rickets, touched on rather lightl in the second session on the thymo-lymphatic systen The subject was opened by J. A. Hammar (Upsala C. Cattaneo (Milan), E. Moro (Heidelberg), and G Mouriquand (Lyon), who dealt chiefly with diagnosi The existence of a clinical entity was agreed, bu opinion varied whether the hyperplasia of th lymphatic system was a cause or an effect of som general metabolic factor, the balance being in favou of the latter view. It was also considered tha *l'état lymphatique avec la mort subite* and the *diathès exsudative* of Czerny, Paltauf, and others were bu different grades of what in England is termed th exudative diathesis.

Psychopathology of Children.

The third subject of discussion was opened b R. D. Gillespie (London) and F. Hamburger (Graz from different points of view. Prof. Hamburge made an effective plea that the pædiatrician shoul

not concern himself too exclusively with the child's body, for it was he who saw most of the psychopathic disorders at a stage when they were comparatively easy to deal with. He was in a position to observe their origins in early infancy, and to distinguish those that were inborn and those that were acquired as a result of early environment. He could mitigate or remove the handicaps encountered by the child when it was beginning to realise that the world contained other persons. Suggestion during the early years of life might determine the course that the child would eventually follow. Present-day physicians and students should attend to this aspect of their duty, although it was not associated with figures and percentages. Dr. Gillespie indicated the lines taken by psychogenic disorders in children, and the symptoms encountered. It was, he said, unwise to interpret the mind of a child in terms of the emotions of an adult, and he did not admit that infantile sexuality played the part in forming the mental make-up of a child sometimes ascribed to it. It was not impossible, he thought, to gain the partial confidence of a child in a clinic with others present; it was therefore desirable for students to attend such a clinic and see for themselves the types of symptoms that were amenable to treatment by the psychiatrist. In the psychopathies of childhood and adolescence the results obtained were equal to those of other branches of medical science. Benjamin (Munich) spoke of the importance of a consideration of the "stubborn phase" (*Trotzphase*) from two to four years of age; many of the neuroses in childhood had their roots, he claimed, in mismanagement at this period of a child's life.

Afternoon Discussions.

During the afternoons group discussions were held. At one of these Ernberg (Stockholm), Wallgren (Goteborg), Alfaro (Buenos Aires), and Johannsen (Goteborg), reported on their studies in *erythema nodosum*. Without exception they considered it to have a tuberculous origin in the majority of cases, the nodules being the manifestation of an anaphylactic reaction to a skin sensitisation. A source of infection could usually be demonstrated. Johannsen maintained that cases of unquestionable rheumatic ætiology were very rare in children, and that in these cases also it was an allergic reaction. Polyarthritic symptoms in association with erythema nodosum were not necessarily rheumatic; cases of acute polyarticular rheumatism with hot swollen joints, which were not pyogenic and did not react to salicylates, should be considered as allergic manifestations of tubercle.

L. G. Parsons (Birmingham) presented a study of the fat metabolism in cœliac disease, in which no evidence was obtained that the increased fæcal fat was due to increased excretion of blood fat. He considered the low fat curve to be the result of defective absorption from the intestine.

S. W. Davidson (Newcastle) described the radiological appearances of five cases of osteochondritis ischiopubica in children between five and eight years, and pointed out the clinical resemblances to early tuberculous hip-joint disease.

J. C. Spence (Newcastle) described 17 cases of nutritional xerophthalmia, and emphasised the significance of skin infections and epithelial cells in the urine as evidence of xerophthalmic diet deficiency. Spence's observations suggested also that the specific food factor involved was not the same as the growth factor or the anti-infective factor for general infections.

B C G VACCINE.

Several reports on the use of B C G vaccine were presented. W. H. Park (New York) said that if as a result of a long series of animal experiments a strain was cultured strictly according to the directions of Calmette there was no danger from increase of virulence. If the method did not provide effective prophylaxis in every case there was, he said, no doubt that a child vaccinated early and carefully protected from contact with tubercle for about two months gained a useful degree of protection against virulent infection in home surroundings. The appearance of a positive Mantoux test was, he thought, the best indication of developing immunity. Drucker (Copenhagen) reported the recovery of tubercle bacilli from the stomach in 100 per cent. of cases of Pirquet-positive children under one year of age. Among these was one child which had been vaccinated with B C G six months earlier, and from whom a bacillus identical with the Calmette-Guérin organism was recovered from the stomach washings.

INTERNATIONAL UNION AGAINST TUBERCULOSIS.

OSLO CONGRESS, AUGUST 13TH–15TH.

In the presence of the King and Queen of Norway, the seventh conference of the *Union Internationale contre la Tuberculose* opened at Oslo on August 13th with a service of music in which the orchestra played Greig's symphonic poem "Spring." Speeches by Prof. Th. Frölich (Oslo), president of the organising committee, and Prof. Léon Bernard (Paris), secretary-general, terminated the formal proceedings.

Preventive Vaccination.

A discussion on preventive vaccination against tuberculosis by means of the Calmette-Guérin bacillus was opened by Prof. A. Calmette (Paris) himself. Immunity against tuberculosis was, he said, determined solely by the presence in the body of living tubercle bacilli. B C G was a living strain of fixed characteristics hereditarily attenuated after more than 230 subcultures on a glycerinated ox-bile medium. It was entirely free from pathogenic characteristics and the presence of bile rendered it more capable of absorption by the intestine of infants. Although when introduced into animals in massive doses it might give rise to tubercles, these underwent regressive changes and disappeared without leaving any trace. The organism, he believed, passed easily through the intestinal wall, and provided the animal was isolated for at least a month from contact with an infectious case an immunity was produced in cattle which lasted for about 18 months—i.e., so long as the bacilli remained in the lymphatic glands. Subjects already infected by virulent bacilli derived no benefit from the vaccine. Prof. Calmette denied that the B C G strain could ever become virulent in the way suggested by S. A. Petroff and others; he regarded such events as the result of accidental contamination. The method had been practised since 1924 in many countries of the world, and a fall in the tuberculosis mortality (and also in the general mortality) had been observed among vaccinated as compared with unvaccinated children. He claimed the method as suitable for universal application.

Qualified support was given by F. Neufeld (Berlin), while W. H. Park (New York) and Heynsieus van den Berg (Amsterdam), from a series of 365 children, recommended the method as free from danger. The

remainder of the ten official speakers had nothing but praise for the method, and advocated its more general acceptance. Some comment arose on the use of the general infantile mortality as a test of the efficacy of the vaccine; L. Bernard said it had been adopted to give greater accuracy, since it was impossible during life to diagnose tubercle with certitude among children. E. A. Watson (director of the Animals Diseases Research Institute, Ottawa) was the principal critic of the method; he had obtained, he said, 36 per cent. of mild tuberculous lesions by the injection of B C G, more or less severe in 2–7 per cent. A. Kirchner (Hamburg) supported Petroff's view. A. Fontes (Brazil) said he had observed no ill-results in a series of over 4000 cases. A. Greil (Innsbruck) condemned not only vaccination but the theoretical conception of immunity. No speaker touched on the recent catastrophe at Lübeck; as the causes of that unfortunate affair are still under consideration by the German health authorities all reference to it was excluded by common consent.

Thoracoplasty.

On the second day, P. Bull (Oslo) reviewed the work done in Norway upon thoracoplasty in the treatment of tuberculosis. He limited its use to chronic cases with unilateral disease in which an attempt to collapse the lung had been made without success. The operation, he said, should be undertaken only after a prolonged period of observation and if the other lung showed no signs. He preferred to perform the operation in two stages; there was no particular difference in results between local and general anæsthesia. Nearly half of the patients who could not be cured by other means were restored to full working capacity.

F. Sauerbruch (Berlin) spoke from an experience of 1200 cases with 40–50 per cent. of cures in strictly unilateral cases. He preferred to operate in one stage under local anæsthesia with ½ per cent. novocain. J. Gravesen (Vejlefjord) said 45 per cent. of over 200 cases had been able to return to work. His operation mortality was 7½ per cent.; he preferred general narcosis with morphine and ether, supplemented by suitable local anæsthetic. H. Morriston-Davies (Ruthin) believed that a large extent of rib resection was only desirable in old fibrous cases; in others it was unnecessary and harmful. After experience of both methods he had reverted without hesitation to the one-stage technique; he preferred a combination of light chloroform anæsthesia with 1 per cent. novocain. The general trend of other papers was favourable to the method and the discussion centred on points of technique. H. Vogel-Eysern (Davos) made a plea for greater application of functional tests for lung capacity before operation.

Teaching of Tuberculosis.

On the third day a discussion on the teaching of tuberculosis to medical students and practitioners was opened by W. His (Berlin), who based his remarks on replies to a questionaire sent out to many universities. While admitting that division into specialties contributed towards our knowledge of medicine, he had been impressed with the danger to science in general by undue specialisation. In no university in the world, however, was the teaching of tuberculosis entirely divorced from that of general clinical medicine. In most centres there were short courses, accompanied by visits to sanatoriums, where in some places students were guests for a fortnight or so. There was, he said, a dearth of post-graduate courses; some were given over a series of week-ends, so that neighbouring practitioners might attend. In Canada courses were provided by a prominent insurance company; some governments and national associations also granted travelling scholarships for this purpose.

Dr. W. B. Soper (New Haven) spoke of post-graduate teaching in America; in places where there was an enthusiast ready and able to give up his time and influence to teaching there existed a flourishing school of tuberculosis. In other places, he said, progress was less evident; a general stimulus was required. Dealing with undergraduate teaching Sir Robert Philip (Edinburgh) said it was not sufficient to train a student so that he was merely able to recognise the well-marked cases of the disease when it presented itself. Tuberculosis was a social malady of vast dimensions, and it was more important to impress the student with the way in which it entered intimately into the medical history of so many individuals. Pulmonary phthisis was not the only form which the disease took, and attention was too closely centred upon it. Undergraduates, he had found, welcomed the subject when it was put to them from a biological standpoint. E. Morelli (Rome) described the new Mussolini Institute for Tuberculosis and Respiratory Diseases which is being built in Rome as an international research centre with accommodation for over 1200 patients.

The conference closed with a meeting of the general assembly of the Union. Upon the proposal of C. Mainini (Buenos Aires) a commission was appointed with representatives from various countries, to consider the standardisation of nomenclature in tuberculosis. N. Heitmann (Government inspector of tuberculosis in Norway) gave a sketch of the development of tuberculosis work in Norway since the passage of the Act of 1900 which enforced notification and a system of treatment, and the part played in providing sanatoriums by the Norwegian Women's Public Health League started in 1896. Although since that date the fall of mortality in the towns amounted to nearly 50 per cent., the general death-rate for all forms of tuberculosis in Norway remains higher than that in Britain.

After the conference visits were paid to outlying sanatoriums, including that of Hagevik, near Bergen, admirable alike in situation and internal equipment.

The eighth meeting of the Union will be in 1932 in Holland, under the presidency of Prof. W. Nolen (The Hague).

SEAMEN'S HOSPITAL SOCIETY.—During the past year 6425 in-patients and 26,069 out-patients were treated at the various hospitals of the Seamen's Hospital Society, nearly half of them at the Dreadnought Hospital at Greenwich, 1538 at the Hospital for Tropical Diseases in Endsleigh-gardens, and 295 at the Queen Alexandra Memorial Hospital at Marseilles. The income was £93,578 and the expenditure £95,497. A new out-patient department and a complete theatre unit are needed at the Dreadnought Hospital at a cost of £35,000, and extensions and alterations at the Endsleigh-street Hospital are estimated at £20,000.

BRITISH DENTAL HOSPITAL.—The annual report states that the work at the treatment centres and clinics of the British Dental Hospital increases steadily. Larger buildings, better adapted and equipped, X ray apparatus, and research workers are needed, but cannot be supplied out of the fees charged to the patients. The centres at Camden-road, Lewisham, Tooting, and Hammersmith provide skilled dental treatment to persons not entitled to benefit under the National Insurance Acts, and another important branch of the work is the provision of dental facilities, in association with a number of metropolitan borough councils, for expectant and nursing mothers and young children. Last year 5273 children from London County Council schools were treated at the Lewisham centre, an increase of 458.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 6, 1930.

THE PHYSIOLOGY AND PATHOLOGY OF DIABETES MELLITUS.

In the Oliver-Sharpey Lectures, of which the second is published in our columns this week, Prof. J. J. R. MACLEOD has reviewed some of the experimental work designed to solve new problems which have arisen as a result of the discovery of insulin. The work was done mostly on depancreatised dogs which, though kept alive and well for a period by means of insulin, were found to die, as a rule, some eight months after the operation, with severe jaundice and fatty degeneration of the liver. The stools of the dogs always contained undigested muscle-fibres and a great excess of fat. On the assumption that the fatal issue might be due to lack of the external secretion of pancreas, Prof. MACLEOD tried giving the animals 2 oz. of raw pancreas a day. With this routine he was able to keep two dogs alive for four years, and but for an unfortunate accident it is probable they would have lived much longer. He suggests that the ability of dogs to survive may be determined by the presence of nodules of pancreatic tissue in the submucous layers of the duodenum. This hypothesis may explain the clinical observation that some patients with carcinoma of the head of the pancreas suffer much less from fatty diarrhœa than others on similar diets. Among other interesting observations was that on the effect of pregnancy. Dr. R. D. LAWRENCE has reported a case[1] which suggests that the fœtus may supply the pregnant woman with insulin during the last weeks of intra-uterine life. In Prof. MACLEOD'S experiments, however, the course of the pregnancy was quite normal, and the insulin requirements did not vary with the approach of full term. This observation renders improbable the hypothesis of fœtal supply, and another explanation must be sought for the change in the insulin requirements which has occasionally been reported during human pregnancy.

The symptoms following the withdrawal of insulin were carefully watched on several occasions, and one point which has an important bearing on clinical practice was noted. The fat animals developed on the fourth or fifth day a severe ketosis associated with vomiting, and died unless insulin was given; the thin dogs suffered much less from ketosis. By analogy, the diabetic patient who is fat is probably in much greater danger than a thin one if the insulin is omitted, and also if the dose is not increased promptly whenever the insulin requirements are greatly raised from any cause. The conditions which regulate the secretion of insulin from the β cells of the islands of Langerhans are fully discussed by Prof. MACLEOD. It has now been proved that stimulation of the right vagus nerve causes a decrease in the blood-sugar. This decrease is probably due to the secretion of insulin, but since we have no means of estimating the amount of insulin present in the blood, the relation cannot be accepted as certain. It is likely that the vagus centre is stimulated as the direct result of the increase in the blood-sugar. Prof. MACLEOD has tested the effect of some of the preparations which have been used as substitutes for insulin. Three substances, synthalin, myrtillin, and bile-salts have been tried, since experimental evidence that they have some effect on the blood-sugar is not lacking. Prof. MACLEOD concludes that synthalin does lower the blood-sugar of normal and diabetic persons, but is of no value in the treatment of coma. He finds that it can replace some 10 to 20 units of insulin, but that in view of its liability to cause toxic symptoms it is of little value in therapeutics. Myrtillin and bile-salts were found to have very little action on the blood-sugar, and none in depancreatised dogs; there seems, therefore, to be little justification for recommending them in the treatment of patients, and still less for prescribing for diabetics substances which have no action on the blood-sugar in any circumstances.

The study of Prof. MACLEOD'S two lectures shows that more is known about the physiology and pathology of diabetes mellitus than of any other disease. That this knowledge is, nevertheless, subject to important biochemical limitations is made clear from that section of Prof. H. S. RAPER'S address to the British Association for the Advancement of Science which deals with the hydrolysis and synthesis of glycogen in the human body (see p. 509). For example, it is not yet known how a synthetic product like glycogen is dealt with in the cell so as to protect it from the disruptive agencies which exist there. Arrangements for this purpose must be present since we know that substances may accumulate in cells which contain enzymes that hydrolyse them; for example, glycogen and amylase coexist in the liver cell. Again it has been proved that when glycogen breaks down in the liver it gives rise to glucose, and it is generally assumed that the synthesis of glycogen from glucose in the cell is brought about by the simple reversal of a hydrolysis which may be catalysed by enzymes under appropriate conditions. These conditions have, however, not yet been realised in vitro, and Prof. RAPER gives reasons for believing that the process is less simple. In his view it is probable that only the living cell can bring about the synthesis of glycogen. And it is at least possible that the substances from which glycogen is produced or bodies derived from them must first become bound up with, or at some stage form an integral part of, the living structure before they are converted into glycogen. Thus much remains to be learnt about even the main biochemical processes which control the metabolism of sugar in the animal body. But in spite of these gaps in our knowledge, the principles

[1] Quart. Jour. Med., 1929, xxii., 191.

of treatment of diabetes mellitus are beginning to stand out clearly, and it will be of interest to see how far these principles can be applied in the treatment of other diseases.

THE WINNIPEG MEETING.

FOR the third time in its life—it is now only two years short of a century—the British Medical Association has met in Canada, where it has been warmly received, the opening ceremony coinciding in fact with a rather embarrassing heat wave. The Toronto meeting of 1906 was held in a storm, during which one of the hospitals was struck by lightning. Of the Montreal meeting held nine years earlier, at which Lord LISTER laid the foundation-stone of the Jubilee Nurses' Home, we have no meteorological recollections. The third has been the largest, the number of registrations exceeding 2900, and the rendezvous all the more fitting inasmuch as the University of Manitoba and its College of Physicians and Surgeons, almost alone of the Canadian provinces, maintain full medical reciprocity with this country. The harassing restrictions of licensure were touched on in a moving part of Prof. HARVEY SMITH'S presidential address, which appeared in our columns last week. Our own General Medical Council has reiterated its desire for Imperial reciprocity of recognition in regard to medical qualifications, a reciprocity which would be facilitated if the Canadian provinces could come to some common agreement about their acceptance of the British Register. In addition to the presidential address, four important clinical addresses were given at Winnipeg. Sir LENTHAL CHEATLE dealt with the primary tumour in breast carcinoma on lines made familiar by his article in a recent issue of the *Cancer Review* (February, 1930). Sir WILLIAM WHEELER'S address on the significance of recoil following visceral decompression touched on the fringe of problems which concern not only surgeons but biochemists and physiologists. An abstract of this appears on page 541 of our present issue. Dr. W. E. DIXON'S address on drug addiction dealt in succession with the caffeine beverages, alcohol, heroin, cocaine, and the newest habit-forming drugs, and included an attempt to assess the world's need of narcotics in order to ensure that restriction shall inflict no hardship on the poor. The final address was on rest, work and play, in health and disease, by Sir FARQUHAR BUZZARD. His reminder that the recreation obtained from games depends mainly on the interest they evoke in the patient is timely; many practitioners nowadays forget that their own enthusiasm for athletic pursuits is not universally shared, and that some patients may prefer to earn by morning exercises the liberty to spend their days in more congenial occupations. On the last day of the meeting the Lister Oration was delivered by Lord MOYNIHAN, who commemorated JOSEPH LISTER in four aspects as benefactor, Quaker, surgeon, and man. The prevailing opinion, he said, was that LISTER was able to do what he did because of his supreme intellectual gifts. What was so often overlooked, he added, was LISTER'S possession of other qualities: his great heart, his humanity, his faith, his intellectual integrity. The clinical and scientific work of the meeting was organised in 14 sections, of which some account will be given in later issues. In the Section of Medicine the subjects of filtrable viruses, functional disorders of the colon, and acute poliomyelitis were covered in successive sessions; in the Section of Surgery recent advances in thoracic surgery, the uses of radium in surgery, and the surgery of the sympathetic nervous system. Special importance attached to the meeting of the Section of Tuberculosis, as it coincided with a visit of the British tuberculosis experts who had been making a prolonged tour of the United States and Canada.

LONDON RUBBISH.

LONDON contains an unparalleled conglomeration of human beings, whose rubbish presents a vast and complex problem about which everyone is becoming anxious. It is agreed that the metropolis is far behind the times in its arrangements for the collection of household refuse, and that the disposal works are out of date and inefficient. Matters were brought to a head by the issue last year of a highly condemnatory report[1] by a Government official in which every class of the community came in for blame. Householders were scolded because they do not burn their refuse, although their ability to do so has been impaired by installing gas fires in accordance with the injunction not to make black smoke; the contractor was scolded for collecting refuse more cheaply than the local sanitary authority is able to do; the authorities were scolded for not adopting uniform methods, although there is no agreement as to what method is the best. The Departmental Committee which was appointed to consider the Dawes report has now issued its recommendations,[2] of which the first and most important are:

(1) That it is no longer practicable for the 29 Metropolitan Sanitary Authorities within the highly developed area of the Administrative County of London separately to dispose of their refuse efficiently, economically and without causing a nuisance, and that the disposal of house, trade and street refuse in London should be centralised and placed under the control of one body.

(2) That the central body should also be responsible for the general coördination of the public cleansing service of London so as to secure, to the fullest possible extent, such uniformity of organisation and equipment as would facilitate the work in all its branches, and that it should therefore have jurisdiction over (*a*) types of refuse collection vehicles and refuse receptacles; (*b*) frequency of refuse collection; (*c*) inflow of refuse to discharge points; (*d*) avoidance of anomalies arising out of borough boundaries; (*e*) types of street cleansing vehicles and general equipment.

The formation and success of the Metropolitan Water Board has evidently led to the suggestion that there should be a Metropolitan Refuse

[1] See THE LANCET, 1929, i., 781.

[2] Ministry of Health. Report of the Departmental Committee on London Cleansing. Cmd. 3613. H.M. Stationery Office. Pp. 27. 6*d*.

Disposal Board; but there is a considerable body of informed opinion which finds little parallel between the problems presented by the supply of water and the collection and disposal of refuse, and which is distrustful of over-organisation. What are the leading facts? Admittedly there is a lack of uniformity in the methods of collecting the material, the arrangements for disposal of the refuse are in the hands of a few contractors among whom there is little or no effective competition, and the dumping of refuse—not only from London but from the great towns in the Outer Ring—in the country and semi-country round about the metropolis has caused much heart-burning. Dumps in the Essex marshes and elsewhere caught fire, emitted poignant smoke, served as a breeding place for flies and rats, and, owing to the continued extension of building, became an offence to an increasing number of persons. Administrative action was taken meanwhile in regard to a number of these dumps, the situation being improved by changed methods in depositing and covering the refuse. Miss SUSAN LAWRENCE, while describing the Essex dumps as a public scandal, pointed out that no Essex authority had yet made full use of its existing powers under the Public Health Act, and stated that the Ministry of Health would press for the discontinuance of insanitary dumps. Her remarks seemed to exclude the prospect of further legislation in the near future.

The Departmental Committee was not itself united on the constitution of the suggested central authority. Two members did not see their way to recommend the setting up of a new body with independent control, as this would involve interference with the powers of existing sanitary authorities. There is no reason to believe that most if not all of these authorities would not bring valuable contributions to a conference with the Ministry of Health on the collection and disposal of rubbish, or that they would not fall in with any suggestion made to them. The recent discussion at the Society of Medical Officers of Health made this pretty clear. No evidence was laid before the Committee that cleansing can be more efficiently done on a larger than on a smaller scale; no new methods were suggested that are not already well known to the cleansing departments. Dumping must be continued because there is ground to be levelled; salvage is of dubious value, although no objection can be raised to the use of suitable household refuse for brick-making provided the refuse is stored in an isolated situation; there is no consensus of opinion that electricity can be produced economically by burning refuse in destructors, even on a large scale. But now that public interest has been aroused, it may well be hoped that sufficient money will be spent on modern equipment for dust collection and for its hygienic disposal, use being made of the machinery of government available to-day.

ANNOTATIONS

VITAL STATISTICS FOR 1929.

The Registrar-General's Statistical Review for the year 1929, Part I. of which has just appeared,[1] confirms the provisional figures for the general birth-rate, death-rate, and infantile mortality issued earlier in the year.[2] The birth-rate of 16·3 per 1000 persons living at all ages was the lowest recorded since the establishment of civil registration in this country, the lowest rates previously being 16·6 for 1927 and 16·7 for 1928. The death-rate of 13·4 per 1000, against 11·7 for the previous year, was the highest since 1919, the increase being due almost entirely to the high mortality from respiratory and circulatory diseases and to the epidemic of influenza during the severe cold of February and March. The infantile mortality-rate of 74 per 1000 live births was 9 per 1000 above that of the previous year, the excess again due to the high mortality of the first quarter. With the exception of the pandemic of 1918–19 the epidemic of influenza was the most severe experienced in this country since the disease reappeared in 1890–91, the mortality being equal to 734 per million living against 196 in 1928. The mortality from respiratory diseases rose from 1507 in 1928 to 2104 per million, but the latter figure had been exceeded in 1920, 1922, and 1924. The mortality from circulatory diseases reached the record figure of 3030 per million, due largely to the deaths of elderly persons during the cold weather of the first quarter of the year. The death-rate from cancer was 1437 per million living against 1425 for the previous year, thus continuing the steady though slight increase over all recent years and being the highest crude rate recorded. The increase affected both sexes but was rather greater for females than for males. The mortality of women from puerperal sepsis and accidents of pregnancy and childbirth was 4·33 per 1000 live births, compared with 4·42 in the previous year. The improvement was not in respect of puerperal sepsis, which actually increased from 1·79 to 1·80, but in "other accidents of pregnancy and childbirth" which improved from 2·63 to 2·53. Although lower than that in 1928 the combined rate is still above the experience of the seven years 1921–27.

[1] H.M. Stationery Office. 7*s.* 6*d.*
[2] See THE LANCET, 1930, i., 195.

OPIUM AND SCOPOLAMINE BY THE MOUTH IN OBSTETRICS.

IN a long article, which is too largely composed of special pleading of a sentimental nature, H. Selheim discusses the pros and cons of the use of anæsthetics in midwifery.[1] With most of his opinions most English obstetricians are, no doubt, in agreement, for they express the general desire to reduce any intense pain in labour or so to control the natural process as to make it as little painful and as little dangerous as possible to the mother as well as the child. When it comes to practical recommendations for bringing about this desired end the novel suggestion offered by Selheim is that midwives should be allowed to administer omnopon and scopolamine by the mouth at the doctor's orders. He recommends a

[1] Med. Klinik, 1930, xxvi., 1103.

particular preparation for use in private practice consisting of omnopon 0·015 g., scopolamine hydrobrom. 0·0005 g., dissolved in brandy and syrup. The dose is to be given about three-quarters of an hour before the most painful stage of labour is anticipated. It may well be that some provision of this kind will be the essential outcome of the desire in this country to bring a measure of alleviation to the labour pains of the thousands of mothers who are confined outside institutions and under conditions which do not permit of ordinary anæsthetic administration.

CONGENITAL CLUB-FOOT.

In 1928 the British Orthopædic Association chose club-foot for the subject of the Robert Jones Gold Medal. The selection of this deformity for a prize essay was timely, for no comprehensive description of its pathology and its treatment seems to have been attempted in English since William Adams published his Jacksonian monograph on the same subject in 1873. Mr. E. P. Brockman, who has now published in the form of a monograph[1] the essay which earned him the medal, begins with an historical survey of the subject; this chapter provides a fair outline of the progress of orthopædic surgery, since the history of the treatment of club-foot up to the advent of Listerian surgery is really a reflection of the evolution of orthopædics. In discussing the nature of the deformity, Mr. Brockman describes the foot as being adducted, inverted, in equinus, and, lastly, plantar flexed or plantaris; this last term was originally introduced by F. R. Fisher, and is here revived with good effect. A suggestive analogy is drawn between club-foot and congenital dislocation of the hip. Mr. Brockman brings forward strong evidence, both clinical and pathological, for maintaining that club-foot is really a dislocation of the astragalo-scapho-calcanean joint, but that the astragalus is practically stationary, whereas the scaphoid has moved downwards, backwards, and inwards, carrying the forepart of the foot with it; the os calcis has also moved inwards. The effect of this migration is to approximate the scaphoid to the sustentaculum tali and thereby to diminish the natural capacity of the socket for the head of the astragalus, which consequently slips out uncovered and becomes palpable on the dorsum of the foot. From this view of the nature of the deformity the author passes on to a full discussion of its ætiology; the various theories are passed under review, a preference being expressed for the hypothesis that the deformity is due to an irregular development of the tissues of the foot and that the fault is of intrinsic origin and independent of extrafœtal influences. This view, it is maintained, best fits the pathological findings; the bones are least affected, for they are of normal shape, but the calcaneo-scaphoid ligaments may be deficient or absent and the muscles which control the socket for the head of the astragalus are contracted. The treatment of club-foot is well described and the difficulties associated with the unfolding of the deformity are thoroughly considered and discussed.

The ideal time to start treatment is about 10 days after birth; the necessary manipulations are set out in detail and the method of splinting favoured is that by means of strapping. The author deprecates the enlistment of the mother to participate in giving treatment, because of the force necessary in handling the foot, but some surgeons would not agree with this view. An intelligent mother is quite capable of carrying out the initial graduated manipulations, massage, and splintage. Tendon tenotomy, which at one time was so popular, is now used only when a resistant equinus remains, to cure which the tendo Achillis may be cut. But the plantar fascia often needs subcutaneous section as an aid to manipulation. In older children manipulation under anæsthesia with plaster-of-Paris fixation is the best procedure, but quite a number of patients are incompletely corrected by this means, and for them open operation is advocated after the age of 3 years. The type of operation described is in principle the one practised in recent years by orthopædic surgeons in this country; the author adds one or two modifications of his own. Ligaments and muscles only are cut, the bones are untouched. The plantar fascia and muscles are detached as far backwards and inwards as possible; the tibialis posticus is exposed and if very contracted is detached from the scaphoid and other tarsal bones. The scapho-calcanean joint is next identified and the ligaments on its inner and inferior aspect incised. By manipulating the foot the deformity should now be capable of correction and can be maintained in the proper position by plaster-of-Paris. In the after-care the teaching of corrective exercises to the child is important. But there remains the stubborn foot, familiar to all orthopædic surgeons of experience, for correction of which none of the procedures named is effective. For this intractable condition a bone operation is necessary, but we agree with Mr. Brockman that this should be delayed until near puberty. Each surgeon has his own method of attack on each case, for standardised plans are of little avail in the major degrees of deformity. Mr. Brockman favours Dunn's operation, which consists of an excision of the scaphoid and arthrodesis of the astragalo-calcanean, the calcaneo-cupoid, and the astragalo-cuneiform joints. Mr. Brockman has provided clear, well-reasoned teaching on one of the most baffling deformities which surgeons are called upon to treat.

[1] Congenital Club-Foot (talipes equinovarus). By E. P. Brockman, M.Chir., F.R.C.S., Orthopædic Surgeon, Westminster Hospital; Assistant Surgeon, the Royal National Orthopædic Hospital. Bristol: John Wright and Sons, Ltd. 1930. Pp. 110. 10*s.* 6*d.*

SMALL-POX AND VACCINATION.

The July *Bulletin* of the Office International d'Hygiène Publique in Paris includes a supplement[1] which will be found valuable by all those who are concerned with the control of small-pox and the promotion of vaccination. The supplement consists of an interim report of the Commission on small-pox and vaccination which was made to, and accepted by, the Permanent Committee of the International Health Office at its last session in May. The Commission dealt in this report with three questions: (1) nomenclature of the varieties of small-pox; (2) the occurrence and distribution of post-vaccinal encephalitis; and (3) the methods of vaccination and the dosage of vaccine which are officialy enjoined in different countries of the world. In so doing, the Commission has touched upon matters which are, at the present time, of special interest in England, and recent English experience has been freely drawn upon. The Commission has carried a stage further the decision of the International Conference on the Nomenclature of Causes of Death, 1929, that the generic term *variola* should be recognised as comprising at least two varieties, *variola major* and *variola*

[1] Obtainable from the Office International, 195, Boulevard St. Germain, Paris.

inor, or alastrim. The distinction, it is emphasised, one of epidemiological type rather than of mere nical characteristics of the individual case. Those hose function it is to collect data as to the occurrence severe complications and deaths, particularly nong the unvaccinated at the most susceptible ges, are usually in a position to satisfy themselves, the course of an epidemic, that the prevalent sease is of the "minor" variety, with few com- ications and practically no mortality, or that it is ie "major" or Eastern type of small-pox, and can pply administrative measures in the light of this nowledge, always with the confidence that the well accinated are protected against any variety of small- px. In respect of post-vaccinal encephalitis, the Com- ission has been fortunate in being able to collate ie experience of two countries in which this rare mplication has been most conspicuous—England id Holland. It has found that the same complica- on is liable to occur after the use of many different rains of lymph in other countries in Europe, and at it must be regarded as a definite risk associated ith vaccination, although it is one which is so rare hardly to require consideration unless the vaccina- on practice of the country entails the extensive imary vaccination of children at school ages, when is undoubtedly a factor which has to be reckoned ith. In this respect the Commission follows closely e findings of the report of Sir H. Rolleston's accination Committee in 1928. The last part of e Commission's report gives an instructive epitome the different ways in which vaccination is practised different countries, and presents a summary of plies to a detailed questionaire which the Office nternational d'Hygiène Publique addressed last ear to the several Governments which it represents. ost of the data given and the opinions expressed this report are new only in the sense that they have en brought together in a convenient form from many rts of the world, but they derive special value from ie broad basis of the inquiry, and from the authority ven to them by the representatives of the numerous ational public health services who took part in it.

THE COLOUR IN JAUNDICE.

THE usual complexion of the patient influences ery greatly the colour of his jaundice; those who e pale and fair tend to present a bright lemon- llow colour, but if the patient is naturally dark the olour is more of an orange tint or bronze. If ssociated cyanosis is present from other causes, a eculiar olive hue is produced; a similar green undice may occur without cyanosis, and it was ng thought that such cases were especially unpromis- g ones. An interesting analysis of jaundice by rof. T. Brugsch[1] is a welcome combination of inical observation and laboratory investigation. e suggests a division of cases of jaundice according their colour into four types, a "red," a "green," "flavin," and a "melasikterus," the last being iat browny tint which Brugsch compares in the ame "melasikterus" to the colour of treacle or olasses. According to him frank green jaundice only found with mechanically produced icterus— iat is, some obstruction is present leading to biliary asis, concentration of the bile, and absorption of is "thickened" bile into the blood; the tint is ie to discoloration of the skin with biliverdin. ed jaundice, on the other hand, occurs in all hepatotoxic" types, such as acute and subacute liver atrophy, and is due to the presence of bilirubin in the skin. The former colour is thus associated with biliary retention, the latter with failure of biliary secretion. When obstruction is present the bile retained in the biliary passages is for the most part oxidised to biliverdin, so that the more such oxidation takes place the greener becomes the jaundice; for this reason the direct reaction of the van den Bergh test in the blood-serum may gradually disappear and its place be taken by an indirect reaction, although the jaundice is undoubtedly obstructive in origin. In red jaundice no oxidation of bilirubin to biliverdin occurs, since the body tissues, apart from the biliary tract, do not appear to possess this property of oxidation; thus any appearance of biliverdin in tissues, skin, or urine is an indication of biliary stagnation. Flavin icterus Brugsch defines as that yellow jaundice which occurs with an indirect van den Bergh reaction in such conditions as hæmolytic jaundice, anæmia gravis, icterus neonatorum, and splenic anæmia. It is jaundice produced outside the liver and especially concerned with the reticulo-endothelial system, particularly the spleen. Clinically the colour is lighter than the red jaundice though of similar tint. Melasikterus is the type seen in conditions of cachexia and is rather a brown pigmentation than a true icterus. The differentiation of these clinical types of jaundice may be further assisted by a study of the iron in the skin. In the presence of the ferric ion an intradermal injection of potassium ferricyanide (freshly prepared 1 per cent. solution) produces a blue colour which is quite independent of the bile-pigments themselves. A positive iron reaction in the skin thus shows the presence therein of bivalent iron and together with a true bilirubin jaundice indicates an origin from hæmoglobin break-down. It is thus positive in red (hepatotoxic) jaundice and negative in green (obstructive) jaundice. It suggests a disorder of the liver-cells themselves.

It must be admitted that the exact mechanism of some types of jaundice is still far from clear, and in particular the rôle of the iron molecule is perhaps not as simple as might be believed from Prof. Brugsch's account. At the same time the broad divisions of colour described in his paper are interesting and serve to emphasise the importance of bedside observation.

LABORATORY OUTBREAKS OF PSITTACOSIS.

RECENT investigations of psittacosis in America have had dramatic sequelæ. In many of the laboratories where the disease has been studied cases of infection amongst research workers and attendants have occurred, some of which have proved fatal. Investigators at first assumed that psittacosis was an *aertrycke* or allied infection, and adopted what they considered suitable precautions, only to find that these were quite inadequate. But even those who came later on the scene, and were forewarned by the bitter experience of their predecessors, have not escaped, for one case of infection has occurred at the Rockefeller Institute despite most elaborate precautions. Perhaps none of these outbreaks has been quite so remarkable as that occurring in the Public Health Laboratories, Washington, which provided the material for a clinical survey by E. Petersen, O. B. Spalding, and O. Wildman.[1] This outbreak affected 11 persons; but its magnitude is not its most important feature, for of these 11 persons 9 had no access to the rooms in which the psittacosis investigation was being carried out. The laboratories concerned are housed in three

[1] Zur Analyse des Ikterus, Med. Klin., 1930, xxv., 413.

[1] Jour. Amer. Med. Assoc., 1930, xcv., 171.

buildings which communicate by tunnels and causeways, but the 11 cases of infection were confined to the personnel of the building in which the psittacosis investigations were being pursued and did not spread into the two other buildings. The infected birds were received on Jan. 16th, and of the three workers who handled them two fell ill on Jan. 25th and Feb. 6th respectively; one case proved fatal. The remaining nine cases appeared on Feb. 15th, 28th, March 10th, 11th, 12th, 13th (two cases) 14th, and 15th. It will be observed that the last seven cases occurred close together, suggesting, as G. W. McCoy points out[2] that they became infected about the same time from a common source. The nature of this common source of infection is obscure. Had any of the patients infected others in their homes one might have thought that the laboratory outbreak was due to spread from man to man; but no home infections occurred and, moreover, the history of this disease suggests that the human case is a negligible source of infection. Why infections should spread from parrot to man with such ease and from man to man with such difficulty remains a mystery, but an almost identical problem is presented by tularæmia and a most interesting line of research awaits the intrepid investigator of either of these infections. We have been fortunate in this country for, with precautions certainly no more elaborate than those adopted elsewhere, laboratory infections have not occurred apart from one relatively mild case.

The clinical part of Petersen, Spalding, and Wildman's communication covers ground now well known and brings no new facts to light. In his investigation of this disease in the Argentine last year E. Barros [3] made free use of X ray examination of the chest and spoke highly of its value. And if convalescent serum has not been used in this country in the treatment of psittacosis, it is for the good reason that experiment has shown it to have little or no protective value.[4] This finding is supported by the results now reported, for in our opinion the evidence provided contains no justification for the conclusion that the use of immune serum in daily doses was of "apparent benefit." A. P. Thomson obtained comparable results with serum from individuals recently inoculated with T.A.B. vaccine.

"SOCIAL ORTHOPÆDICS."

SINCE 1924 the *Cripples' Journal* and the *Cripple* have served a useful purpose in keeping the social side of work for physically disabled children before a wide public, and before these journals came to an end (at all events in their present form) their editor, Mr. Frederick Watson, called on the expert knowledge of his collaborators to produce a book [5] which he describes as "nothing more ambitious than an outline of some past and future problems of disablement in domestic life and industry." He does less than justice to an enthralling account of the fate of the cripple through the ages, from the Old Testament conception of deformity as a thing accurst, and the persecution of the Middle Ages, to the belated humanitarianism of the nineteenth century. In this historical survey he touches on the deformities once common among lace-making children in England, one of the evils of child labour which is still vigorously alive among the carpet-makers in Persia. A chapter on th influence of the war shows the evolution of th voluntary county and after-care clinics in Shropshir as a result of the stimulation of public sympath towards crippling; following this came the Red Cro campaign against rheumatism. In discussing th education and training of the cripple Mr. Watso stresses the importance to the State of a man who ca bear at least part of the burden of his maintenanc In this field America has far out-distanced us; a interesting chapter is devoted to the American schem under which every citizen has a right to vocation training for direct employment or rehabilitatio after accidental injury. In the final chapter outlined an abstract rather than a concrete constructiv policy, but at the present time it is perhaps impossib to do more. In the establishment of the new faith humanitarianism and in the extension of voluntar agencies for their relief and education cripples wil he believes, find salvation. The book is appropriatel dedicated to Sir Robert Jones.

THE TREATMENT OF TETANUS.

THE treatment of tetanus by massive doses antitoxin has a sound basis of experimental worl In 1917 Sherrington showed that antitoxin injecte in suitable amounts would protect monkeys in whic the disease had been produced artificially by th injection of toxin, but attempts to cure patien already showing signs of infection by this mea have proved disappointing. Dr. A. E. Paterson has just published the results of treatment of tetan in children by larger doses of antitoxin than ha previously been given. These results are so striking successful in comparison with those of previo observers that his method deserves wide publicit The outstanding feature of his practice is the amou of antitoxin given both at the beginning and throug out the illness. As a routine 100,000 (America units are given intravenously and 40,000 intr muscularly in the first place; the former dose repeated in 12 hours and then again at 24-hour intervals according to the clinical progress of th case, while the latter is repeated four-hourly, th amounts being gradually lessened and later given less frequent intervals. With this method of 2 consecutive patients 19 recovered, the dosage the successful cases ranging from 120,000 to 1,970,00 units. Difficulties connected with this treatment a that intravenous therapy in patients with tetanu especially in children, usually requires a gener anæsthetic, and the expense of large doses of ant toxin is considerable. Moreover, the injection a large amount of horse serum is not easy. Th last-named obstacle has happily been considerabl mitigated by the more concentrated antitoxin no on the market, the volume of 100,000 units now bein 60 to 70 c.cm. instead of 300 c.cm. as formerly. D Paterson quotes some cases in his series which a of especial interest. One patient with an incubatio period of six days progressed well for five days bu then died suddenly during a spasm. He had onl been given 240,000 units of antitoxin in this time and it is possible, in view of the results with later case that larger doses might have saved his life. Anothe case showed clearly that antitoxin should not b discontinued too soon, but should be carried on we into convalescence. This was a moderately seve infection which reacted well during the first few da of treatment. The intravenous injections wer

[2] U.S. Public Health Reports, 1930, xlv., 843.
[3] Día Médico, Dec. 30th, 1929.
[4] Sacquépée, E., and Ferrabouc, L.: Presse Méd., 1930, xxxviii., 569, and London Hospital Investigations (unpublished).
[5] Civilisation and the Cripple. London: John Bale, Sons and Danielsson. 1930. Pp. 120. 10*s.* 6*d.*

[1] Med. Jour. of Australia. 1930, i., 832.

ıerefore, discontinued during the fourth day, but ı the fifth day the patient relapsed and the dose had be increased again. The patient then recovered. opley and Wilson [2] explain the discrepancy between ıerrington's results and those obtained in clinical ractice by the facts that toxin and not bacilli were jected by him and that the doses he used were ıormous considering the weight of the animals. he dosage used by Dr. Paterson is relatively only ightly less than that used by Sherrington. The ıthor is the first to admit that his series is too nall for any certain claims about the value of massive ıses of antitoxin to be made. They do, however, rongly indicate that the doses used hitherto have ·en much too small, and his results justify an ıtensive trial of larger doses particularly now that ıncentration of serum has overcome one of the chief ·chnical difficulties.

ICIDENCE OF CANCER IN MENTAL PATIENTS.

RELATIVE immunity to cancer in races and individuals is always of interest and the detailed investigaon of the phenomenon has been considered a fruitful ıth of research. The incidence of cancer on rtain races in Europe was studied in 1925 for the eague of Nations Subcommittee on cancer statistics, ıd Prof. Eugène Pittard, after undertaking this vestigation, had little doubt that the Nordic race as more subject to cancer than the other European ces and the Mediterranean race least so. A less mplex problem for detailed research was suggested the Commissioners for Lunacy in England, who their annual report for 1909 made the observation ıat the asylum patient appeared to be relatively ımune to cancer, as also to bronchitis, compared ith the general population. The Commissioners ointed out that the age incidence was the same in ıe two groups—that is to say, the normal population ıd the mentally affected, and that there had been ıe same apparent increase in the incidence of cancer both sections of the community in recent years. lthough the subject came under notice again in 923, nothing was done till 1929 when the newly eated infectious diseases subcommittee of the Royal edico-Psychological Association sent round a ıestionaire to 72 mental hospitals and then referred ıe replies to a professional statistician. The outcome[3] ıows, first, that both in the sane and the insane ıere has been a steady increase in the mortality om cancer recorded during the last 10 years from 919–29. Whether this is a real increase or merely ı apparent one due to more accurate statistics is impossible to say; since medical statistics were ıite inadequate in the past, an increase in cancer ıses with more carefully compiled figures is to be xpected. Secondly, the figures show that approxiately one-seventh of the deaths in England and Vales are attributable to cancer whereas only one-venty-sixth of the deaths in the mental hospitals are ıe to this disease—a much lower figure. Finally, for ıe period 1920–28 the death-rates from all causes the 72 mental hospitals are compared with those nong persons aged 15 years and upwards in the eneral population of England and Wales. The tal death-rates are 79 in the mental hospitals ıd 13 in the general population, while a comparison cancer death-rates show that there are 306 in the mental hospitals to 176 in the general population —i.e., less than twice as high. Before accepting these figures as representative it is necessary to ascertain how far the lower proportion of deaths from cancer in the mental hospitals is explainable by the very heavy death-rates in these institutions from other causes, such as general paralysis and tuberculosis. The "professional statistician" (unnamed) who analysed the figures for the Association draws attention to this need, and it is to be hoped that this important part of the study will receive prompt attention. Meanwhile an interesting addition to the report is the outcome of an investigation carried out by Dr. Arthur Pool at the County Mental Hospital, Rainhill. Dr. Pool undertook a study of the incidence of cancer in this institution over a period of 25 years, basing his figures upon an analysis of post-mortem records. He believes his results to confirm the low incidence of cancer in mental hospitals compared with the general community, but finds no increase in incidence with the passage of years; this last result, based as it is on actual port-mortem findings, is worthy of consideration. It is not, however, recorded what proportion of patients dying in the institution during the period covered by the inquiry were submitted to autopsy. If this proportion was not very high indeed some cases of cancer may have been missed. This is a less unwieldly field of research than is presented by the investigation of racial cancer; but more work, will be necessary to eliminate possible errors before definite conclusions can be drawn on the lines of detailed research planned out.

[2] Principles of Bacteriology and Immunity, Londen, 1930.

[3] (*a*) First Report on the Comparative Incidence of Cancer Mental Hospital Patients and in the General Population of ngland. By J. R. Lord, C.B.E., M.D., F.R.C.P. Edin., and . J. McGrath, M.B., D.P.M. (*b*) The Incidence of Cancer at ainhill Mental Hospital. By Arthur Pool, M.D., M.R.C.P., .P.M. London: Adlard and Son. 1930. Pp. 22. 9*d*.

INTERNATIONAL LEAGUE AGAINST TRACHOMA.

IT is proposed that the next meeting of this League should be held in June, 1931, at Budapest. At the recent meeting of the League at Geneva, when Prof. de Grosz was elected President, the following were chosen as vice-presidents and members of the executive committee: Dr. Marquez (who was chairman of the International Ophthalmological Congress in Madrid), Mr. Szymansky (President of the Polish Upper House), Mr. MacCallan (representing the Ophthalmological Society of the United Kingdom), Mr. Morax (Paris), Mr. Angelucci (Naples), Mr. Birch-Hirschfeld (Königsberg). Other members of the executive committee are Mr. Brandes (Antwerp), Mr. Kadlicky (Prague), Mr. van der Hoeve (Leiden), Mr. de Lapersonne (Paris), Mr. Park Lewis (Buffalo, U.S.A.), and Mr. Miyashita (Tokyo).

THE ORAL ADMINISTRATION OF ŒSTRIN.

To the lay and also many medical minds it must have caused some astonishment that the International Congress for Sex Research, held in London during August, was concerned less with the sociological aspect than with the chemical side of sexual activity. The papers and discussions for the most part centred round the physical, chemical, and physiological properties of the internal secretions of the sex glands. It has long been known that the glands of internal secretion which play a part in sexual functions are not merely the gonads themselves but include more particularly the pituitary. In fact, recent work has been concentrated on the pituitary and the placenta to such an extent that œstrin and the testicular hormones have been temporarily eclipsed. Many of the communications at the Congress emphasised the importance of the pituitary, but the gonads were given due prominence. At Chicago, T. F. Gallagher,

F. C. Koch, and their colleagues have been working on the testicular hormone and described, among other developments, the method of testing the extract of testes upon comb growth in capons. The properties of the hormone were detailed. It seems clear that this work opened up an entirely new field in endocrine work. Amongst a number of interesting communications was one by Schoeller, Dohrn, and Hohlweg which dealt with the vexed question whether œstrin is active when given by the mouth. The original workers in America hold definitely that œstrin is inactive when given in this way, but in Europe it has been shown that oral administration can be effective under certain conditions. Allan, Dickens, and Dodds [1] found that some 25–30 times the subcutaneous dose was necessary to produce an effect on rats and that the distribution of the dose played a very important part in determining its activity by the oral as well as by the subcutaneous route. In Germany it has been claimed by many of the foremost workers that the amount required to produce œstrus when given by mouth is relatively little greater than when the subcutaneous route is employed; thus, Zondek maintains that the relationship is 5 : 1. Laqueur, on the other hand, maintains that 100 times the subcutaneous dose is necessary to produce signs of activity. Schoeller, Dohrn, and Hohlweg have now proved that another factor besides the distribution of the dose is significant—i.e., the purity of the material used by the different workers. Experiments with material of different degrees of purity showed the less pure material to have the stronger effect. Thus, with the pure crystallised follicular hormone (8 million units per gramme), it required 50 rat units to produce œstrus in 50 per cent. of the animals; with a preparation containing one million units per gramme 30 rat units were sufficient, and with one containing 0·2 million units per gramme 6 rat units had the desired effect. Moreover, it was found that with the aqueous alcoholic preparations the potency increased approximately in proportion to the amount of alcohol added. These important observations open afresh the question of giving hormones by the mouth, and it may be that a careful preparation of œstrin will be found effective when given orally.

[1] Jour. Physiol., 1930, lxviii., 348.

STATISTICS OF MEDICAL PROFESSION IN GERMANY.—A statistical record of the German Health Office states that the number of medical men has increased between 1887 and 1928 from 15,824 to 43,948. In 1887 7·2 medical men existed for each 10,000 of the population, whilst in 1928 33 were registered, that is, while there was formerly one medical man to 3000, now there is one to only 1400 inhabitants. From 1909, when qualifications were first granted to women, to 1913, the proportion of medical women to medical men was 1 : 26·5 against 1 : 5·4 in 1928. In 1928 the number of specialists was 8000, of whom 188 were medical women; 63 per cent. of the profession lived in towns and 37 per cent. in the country, the respective number for women being 79 and 21 per cent. respectively. While the number of medical men and women is continually on the increase, the number of midwives is diminishing. The number of nurses with general training is also increasing, the records for 1887 and 1928 being 14,000 and 102,000 respectively. As to unqualified persons, there were 1713 in 1887 against 12,000 in 1928, so that for each 10 qualified medical men and women 2·64 quacks are now engaged in practice.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Proby. Surg. Lt. J. J. Dwyer to be Surg. Lt.

Surg. Lts. C. H. Birt to *Ormonde* and R. E. P. Cohe to *Glorious*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. G. A. Clark to *Victory*, for R.N. Hospita Haslar.

Surg. Lt. A. S. Bradlaw to be Surg. Lt.-Comdr.

Surg. Lt. (D.) C. H. A. Fido to be Surg. Lt.-Comdr. (D.)

Surg. Sub-Lts. J. N. Matthews to *Champion* and B. Blewit to *Victory*, for R.N. Hospital, Haslar.

Prob. Surg. Lt. (D.) H. P. Buchanan to *Victory*, fo R.N. Hospital, Haslar.

Proby. Surg. Sub-Lts. J. C. Moor and J. E. Davenpor to be Surg. Sub-Lts.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Majs. (temp. Lt.-Cols.) to be Lt. Cols.: E. Gibbon, vice Lt.-Col. T. S. Coates, promoted and R. W. D. Leslie, vice Lt.-Col. M. G. Winder, retd.

The undermentioned Majs. to be temp. Lt.-Cols.: C. Scaif and D. M. Corbett.

Capt. D. C. Bowie to be Maj. (prov.).

The undermentioned Lts. to be Capts. (prov.): T. E Moles and J. H. Anderson.

Lt.-Col. E. W. Siberry, having attained the age-limit o liability to recall, ceases to belong to the Res. of Off.

Lt.-Col. M. G. Winder retires on retd. pay.

Lt. E. H. Hall to be Capt. (prov.) and remains secd.

The undermentioned Lts. (on prob.) are secd. under th provisions of Art. 205, Royal Warrant for Pay and Pro motion, 1926: J. T. Robinson, T. M. Corcoran, and R. I Whittaker.

The undermentioned Lts. (on prob.) are confirmed i their rank: H. C. Benson, D. A'Brook, A. N. B. Odbert W. J. Officer, T. N. Fogarty, A. F. Kennedy, and J. C Macfarlane.

The undermentioned to be Lts. (on prob.): A. Guirdham J. T. Robinson, M. A. Rea, and T. M. Corcoran.

Lt. F. R. Gedye resigns his commn.

ARMY DENTAL CORPS.

The undermentioned Capts. to be Majs.: C. T. Hastin J. J. Boyle, and J. H. W. Fitzgerald.

Lt. (on prob.) A. F. D. Shapland is confirmed in hi rank.

Maj. T. K. Place is placed on the half-pay list on accoun of ill-health.

ARMY RESERVE OF OFFICERS.

Lt.-Col. A. D. O'Carroll to be Lt.-Col.

Capt. G. Moore, having attained the age-limit, retires an retains his rank with permission to wear the prescribe uniform.

T. A. Danby to be Lt.

TERRITORIAL ARMY.

Capt. T. S. Goodwin to be Maj.

INDIAN MEDICAL SERVICE.

Capts. R. C. Watts and Hari Das to be Majors.

The undermentioned Capts. (prov.) are confirmed in the rank: C. A. Bozman, M. L. Ahuja, and W. J. L. Neal.

Lt. T. C. Puri to be Capt. (prov.).

Lt. (on prob.) A. K. M. Khan to be Capt. (prov.) (on prob.

Lt. G. D. Mehta relinquishes his temp. commn.

INDIAN MEDICAL DEPARTMENT.

Senr. Asst. Surg. and Maj. A. E. Clarke retires.

ROYAL AIR FORCE.

E. W. B. Griffiths is granted a short service commissio as a Flying Officer for three years on the Active List.

M. Pearson is granted a temporary commission as Flying Officer.

Flight Lt. C. W. Coffey is transferred to the Reserv Class D. (ii.).

Flight Lt. P. E. Brown is promoted to the rank of Squadro Leader on promotion to Maj. in the Army Dental Corps.

MACKENZIE MEDAL FOR OPHTHALMOLOGY.—The custodians of the Glasgow Eye Infirmary hav awarded the William Mackenzie Medal for 1929 for origin contributions to ophthalmology to Prof. J. van der Hoev of Leiden, Holland. At 8.30 P.M. on Oct. 3rd he will giv an address at the Infirmary on Ophthalmology in it Relation to Other Branches of Medical Science.

CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS

Series of Special Articles, contributed by invitation.

LXXXIII.

THE CLINICAL SIGNIFICANCE OF SLIT-LAMP APPEARANCES.

PART III.*

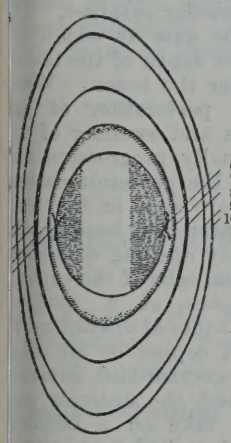
The Lens.

THE application of the slit-lamp to the crystalline ns has added to our knowledge of the anatomical ıd pathological appearances of this structure and ıe apparatus has become an essential for the iagnosis of various forms of cataract. Various ieans of examination are open to us:—

(*a*) Oblique illumination in focal light.
(*b*) Transillumination of anterior layers of lens substance y light reflected by deeper layers.
(*c*) Examination in zones of specular reflection, especially hen viewing the anterior and posterior surfaces of the ns or those of the adult nucleus.
(*d*) Most important is the use of the optical section which ds us in judging the relative position of opacities and the)proximate date of their appearance.

When the normal lens is examined it will at once e appreciated that it is not of uniform density ıroughout. It will also be observed that, in the lult lens at any rate, the changes in density occur)mewhat abruptly so that various well-defined layers are brought into prominence.

The diagram (Fig. 6), taken from Koby's book, shows the various surfaces of discontinuity where these abrupt changes take place.



IG. 6.—Diagram to show the surfaces of discontinuity of the lens. The numbers refer to the text. (Koby).

These so-called zones of discontinuity are named: (1) anterior band of the lens; (2) anterior band of discontinuity; (3) anterior band of the adult nucleus; (4) anterior peripheral band of the fœtal nucleus; (5) anterior central band of the fœtal nucleus; (6) posterior central band of the fœtal nucleus; (7) posterior peripheral band of the fœtal nucleus; (8) posterior band of the adult nucleus; (9) posterior band of disjunction; (10) posterior band of the lens. The clear interval between 5 and 6 is spoken of as the *central interval* of the fœtal nucleus, and here the density of the lens is most uniform. That portion the lens between the anterior and posterior bands of the etal nucleus represents the lens at birth. By about 25 years ıe adult nucleus is completed, and that part of the lens which outside these limits is called the cortex. The surfaces of ıe lens itself and those of the adult nucleus may be examined the zone of specular reflection so that now we no longer ıerely examine images formed at these surfaces (the images Purkinjé) but the surfaces themselves. It has long been nown that there is a system of sutures at the surface of the ns, and the slit-lamp has shown that this system is present the level of each surface of discontinuity. The sutures ıe simplest at the surfaces of the fœtal nucleus, the anterior eing in the form of a Y, whilst the posterior is in the form an inverted Y. These two figures are most useful in eciding the limits of the fœtal nucleus and hence in deciding ıe relative position of an opacity in the lens. The further moved we are from the surfaces of the nucleus the more mplicated the suturing becomes. The surfaces of the lult nucleus in later life show a relief like a plastic geographical map, and this is sometimes visible with the ordinary loupe.

The cortex of the lens increases with age as we would expect, knowing that the lens grows throughout life. The surface of the lens besides its suturing exhibits a peculiar shagreen; an example in ordinary life is seen at the surface of books bound in Morocco leather. This shagreen becomes modified and then disappears as a lens becomes progressively cataractous.

Certain congenital anomalies have been discovered in the lens and those already known have been examined and described in more detail. In connexion with remains of pupillary membrane fine filaments are sometimes adherent to the anterior surface of the lens, whilst in other cases the only remnant is a collection of fine brown stellate cells in the pupillary area. Almost constantly the remains of the hyaloid artery may be found down and in from the posterior pole of the lens, taking on the form of a small opaque disc to which is attached a short cork-screw like structure. Several cases of posterior lenticonus have been described although the condition does not appear to be strictly congenital as the fœtal nucleus in all cases has been found intact. The conical backward bulging causes a circular convex surface at the base of the cone to be presented forwards towards the light. Being a convex mirror it causes a circular reflex (the reflex of Vogt) which is also seen in connexion with the bulging backwards of Descemet's membrane in disciform keratitis. Posterior lenticonus is always associated with cataract in the posterior cortex. A common congenital opacity is seen in the form of tiny brilliant white dots at the level of the anterior Y of the fœtal nucleus. This suture may also show marked opacity, known heretofore as stellate cataract.

CATARACT.

Anterior capsular cataract is rare and is surrounded by a peculiar halo where no shagreen is seen. When anterior polar cataract is present its connexion with early life is shown by the fact that it may be reproduced at the surfaces of discontinuity in connexion with the fœtal and adult nuclei. Zonular cataract may occur as a congenital or an acquired condition and we may judge as to which it may be by its size and position. The opaque disc is seen to be formed of tiny white dots, a condition usual in all forms of nuclear cataract. Riders are commonly present, and Vogt has pointed out that they are often in the immediate neighbourhood of clear gaps in the periphery of the opacity.

Among the senile changes which occur in the lens the slit-lamp has been able to demonstrate that many changes, non-cataractous in nature, are commonly seen. These changes may or may not be associated with senile cataract.

As compared with that of the child the lens of the old person shows an increased internal dispersion of light. This is often associated with a deepening of the colour in the posterior part of the lens which is yellowish in appearance. This is partly due to the normal fluorescence of the lens whereby the light passing to the posterior part of the lens is deprived of some of the blue rays, and, after reflexion from the back of the lens, is further filtered before it reaches the observer; the result is that the rays from the red end of the spectrum predominate. Crystals with red or green reflex are sometimes seen. An almost constant feature is the formation of a relief at the surface of the adult nucleus and this may be examined best in the zone of specular reflexion. When performing an examination by retinoscopy one often finds a good deal of irregular refraction in the lenses of older patients. This is now demonstrated to be

* Parts I. and II. appeared in our issues of August 16th and 3rd respectively.

due to the formation of clefts filled with clear fluid occurring in the more superficial parts of the lens. They may arise in the site of a suture, when they are often regular in outline and may occur elsewhere among the fibres of the lens, where they are very irregular in outline. They make their appearance after 50 years of age, and are usually associated with lens opacities.

The slit-lamp has allowed us to observe a new phenomenon in the senile lens, which is usually associated with cataract. It is known as *lamellar separation* and is situated in the middle and deep layers of the cortex. It consists of a series of parallel lines running up and out from the lower nasal part of the lens. It is much more frequently seen in the anterior than in the posterior cortex.

From the clinical point of view the slit-lamp is so useful that it is possible to arrange the various types of presenile and senile cataract depending largely upon the layers of the lens in which the opacity occurs.

A very common type of presenile cataract seen in 25 per cent. of adults is *coronary cataract*. It interferes little, if at all, with vision since it is situated in the periphery of the lens and is only uncovered if the pupil be fully dilated. The opacities are thin so that they may be missed with the ophthalmoscope. They are club-shaped, nummular, or annular and appear blue or brown, depending upon the incidence of light. Another type of presenile opacity is *dilacerated cataract*. It is moss-like in appearance and appears, possibly congenitally, in the deepest part of the adult nucleus. *Cuneiform cataract* has been usually described in the past as peripheral striæ. These opacities occupy the deepest cortex, are whitish in colour, wedge-shaped, and occur both in front and behind the adult nucleus meeting by their base at the periphery of the lens. Dust-like cataract in concentric layers appears as very small opaque dots in the surface of the adult nucleus and the adjacent cortex. Posterior saucer-shaped cataract is usually described as posterior cortical opacities. It occurs in the most posterior layers of the cortex as a single layer. The opacities are dense and may be vacuolated and crystalline. Although it may not be very apparent with the ophthalmoscope, nevertheless it affects vision considerably and calls for early operation. Fortunately, the lens is considerably sclerosed so that extraction is not unduly difficult.

The opacities so far described which occur in the cortex are usually fairly gross in size contrasting with nuclear opacities which are usually minute.

Nuclear changes are seen in three forms: central hyper-refringence, black cataract, nuclear cataract proper. At the time when practically all we knew of the surfaces of the lens was their property of acting as mirrors producing images of Purkinjé, in certain cases it was noticed that two small subsidiary images appeared between those produced by the anterior and posterior surfaces of the lens. These were found to be produced by the anterior and posterior surface of the nucleus, and when it occurred it was noticed that the eye suffered from a marked degree of negative abberation. The condition was called false lenticonus. The slit-lamp has shown that there is an increase in the optical density of the nucleus of the lens. This increase begins in the anterior part of the fœtal nucleus, then the rest of the nucleus becomes involved and the central interval is filled up. The result is that the nucleus becomes homogeneous and of increased density throughout. In *black cataract* the increase in optical density of the fœtal nucleus is accompanied by a yellowish coloration especially well marked in the posterior part. This coloration may be red-brown or black. These changes in the nucleus are usually accompanied by senile changes in the cortex. In *nuclear cataract* proper there is a diffuse increase in optical density of the nucleus associated with actual opacity which begins in the deep layers of the fœtal nucleus, finally enveloping the adult nucleus. Here again there are usually senile changes generally of a cataractous nature in the cortex. *Injury* may cause dislocation of the lens, and when this takes place into the anterior chamber the slit-lamp allows a more detailed examination than is otherwise possible. Subluxation of the lens is practically always associated with prolapse of vitreous into the anterior chamber; in such a hernia of vitreous of greater or less size may be seen protruding through the pupil and covered in tiny brown particles of uveal pigment.

Peculiar changes are seen in the anterior capsule of the lens in glass-blowers and others who work with a furnace. The change consists in a peeling off of the most anterior layer of the capsule, known as the zonular lamella. The anatomical features of Vossius' ring, produced in the lens by a blow upon the eye, have been explained. The condition is now known as traumatic annular deposit. The ring consists of a circular deposit of brown amorphous granules on the capsule of the lens, actually an impression of the pupillary margin. Traumatic cataract appears in different forms depending upon whether the lens capsule has been opened or not. When the capsule is intact a characteristic opacity appears as a white rosette in the posterior cortex just under the cortex. This cataract is easily distinguished from other types of posterior conical opacity by its rosette shape and the fact that there is no lustre upon its surface. The prognosis of this condition is good. Occasionally a portion of the opacity persists, and if this occur in a young subject it may become buried in newly formed lens fibres the result being a traumatic lamellar cataract. The slit-lamp allows us to judge the date at which the accident occurred by the relative depth of the lesion the deeper the opacity the older the lesion. When traumatic cataract follows a perforation of the capsule a localised opacification and swelling of the lens fibres results. This is usually progressive and is associated with a rosette at the posterior cortex. The earliest signs of siderosis are seen in the lens a group of tiny brown dots appear first beneath the capsule just outside the pupillary opening consisting of iron impregnating the epithelial cells of the capsule itself. Later the lens becomes of a uniform brownish colour and the various zones of discontinuity disappear. When a particle of copper or an alloy of copper remains in the eye a greyish-blue cataract which is very thin is found, and the anterior and posterior surfaces of the lens take on a brilliant polychromatic lustre as if the lens had been plated with copper

Besides the changes in the anterior capsule mentioned previously other changes are produced in the lens in furnace workers. The disc line opacity at the posterior hole of the lens is well known. Some light has been thrown on the origin of this type of cataract by experimental work with infra-red rays focused upon the lens. In less than an hour cortical opacities may be produced. Recently considerable attention has been paid to certain changes that may take place in the superficial layer of the capsule in which a bluish lace-like membrane appears on the surface of the lens and peels off in small pieces. The importance of this process is that it is a cause of glaucoma (Glaucoma capsulo-cuticulare).

We are able to distinguish *complicated cataract* from other forms by certain marked appearances that have been demonstrated with the slit-lamp. The earliest change in the lens in the appearance of a polychromatic lustre at the posterior hole of the lens.

his appears before any opacity can be seen in ie lens and consequently is of prognostic import- ice. The opacity that subsequently appears involves veral layers of the posterior cortex and advances ially, in contrast with the posterior cortical opacity senile cataract.

A whole series of cataracts of peculiar appearance is been demonstrated by the slit-lamp; these parently arise in connexion with general diseases which there is apparently some deficiency in the ternal secretion of one of the glands. Roughly eaking these cases are similar in that the opacities e relatively small and appear in the superficial yers of the cortex just underneath the zone of junction. The diseases in which these opacities e found are myotonia atrophica, post-operative tany, traumatic myxœdema, mongolism and etinism.

Diabetes has been stated to be a frequent cause cataract, but it is only recently that a type of taract peculiar to diabetes has been described. the early stages the appearance is quite charac- ristic; a great number of tiny opacities in the most perficial layers of the cortex gradually fading away to the substance of the lens and the appearance small water clefts.

The Anterior Third of the Vitreous.

Only the anterior third of the vitreous can be ex- ined by the slit-lamp, and unless the pupil be dilated ly a very small portion in the axis of the eye. The rmal vitreous differs in its visibility in different rsons, but in a case in which it can be well seen the treous appears in a framework which is moderately minous and an optically empty fluid portion. This appearance is maintained in such a way, that although the structure oscillates in movements of the globe, yet when the eye comes to rest the original pattern reappears. In old age a characteristic appearance of the vitreous is sometimes seen. The strands of the framework become broken and small white irregularities appear on them. We have already noted the constant scattering of tiny particles of uveal pigment in the vitreous in contusion of the eye, and when the vitreous is prolapsed into the anterior chamber in dislocation of the lens or after discission of the posterior capsule. When there has been a perforating injury of the globe with prolapse of vitreous the framework of the vitreous is dragged towards the perforation in a characteristic manner and is a permanent change. In inflammation of the uveal tract we may see a complete destruction of the vitreous framework together with the appearance of opacities which are deposited on the fibres or float apart in the more fluid parts. The appearance in vitreous hæmorrhage is surprising. Unless the hæmorrhage is very gross and there are large clots in the vitreous visible by ordinary methods of examination we see fine white opacities deposited on the fibres of the framework and small reddish opacities, apparently blood corpuscles. It has commonly been stated that synchisis scintillans is due to cholesterin crystals in the vitreous. The appearance by the slit-lamp does not support this suggestion, since the opacities have not the form of crystals but of glistening white globules strung together like beads.

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SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION.

ON August 28th, during the annual meeting of e Association at Winnipeg, Sir WILLIAM WHEELER livered a clinical address on the significance of

Recoil Following Visceral Decompression.

Excluding traumatic and acute inflammatory nditions, he said, a large number of the patients io sought advice suffered directly or indirectly m the effects of pressure or back pressure on an gan or system. An external stress acting slowly is followed by a mechanical adaptation; acting ickly, it might produce a strain sufficient to rupture irreparably disturb an organ or system. Unrelieved, led to secondary pathological phenomena and, if ddenly relieved, the recoil might cause cell rupture, scular derangement, or disturbances to the nervous echanism. The change produced in an organ by adually-increasing back pressure was probably imarily vascular. The direct pressure, combined th reflex vasoconstriction, closed some of the pillaries, thereby causing decreased blood-supply d function. On sudden removal of pressure e capillaries expanded and, with the removal of the soconstrictor reflex, the arterioles also dilated, oding the organ with blood. Cellular œdema, scular stagnation, and functional collapse supervened. eatment appeared to be governed by the universal principle that the greater the pressure the more gradual should be the relief. This principle applied to "medical," "anæsthetic," and "obstetric," as well as to "surgical" back pressure. Patients with back pressure in the heart were treated by those drugs which had the slowest and most prolonged action; if it were possible to reduce the blood pressure suddenly the cure would certainly be worse than the disease, for failure of heart and kidney would inevitably follow. Anæsthetists used spinal injection or chloroform cautiously if their patients had high blood pressure, for the rapid fall induced by these methods might produce an alarming reaction. The oculist dealt with glaucoma by gradual withdrawal of aqueous humour and avoided retinal detachment, vascular dilatation, and intra-ocular hæmorrhage by gradual decompression. If a hydramnios formed rapidly the circulation suffered and the patient complained of cyanosis of the lips, hands, and feet, and of indigestion and vomiting. If the membranes burst, however, the recoil caused syncope. The obstetrician laid special stress on making a very small or valvular opening in the membranes to ensure that the waters escaped slowly. Again, if the fluid from a hæmatocolpos were not drained slowly the patient might suffer extreme shock. In the realm of the obstetrician there was a striking example of accommodation to ever-increasing intra-abdominal pressure and to its release. M. Remy, however, had suggested that the evil results of release of pressure might be seen even in normal childbirth; death might occur without any lesion by a sort of

inhibition on the heart, as he put it, from the abdominal sympathetics.

THE KIDNEY AND LIVER.

Back pressure in the urinary tract was comparatively well understood. Cardiovascular disease kept company with prostatic enlargement in about 42 per cent. of cases, and improved as the renal function was restored. Gradual decompression was advisable in all cases, whether there was evidence of back pressure or not. Rapid emptying of a distended bladder by any means might be followed by acute œdema and congestion of the urinary tract, resulting in loss of function. These destructive changes contrasted vividly with the repair changes which followed decompression. A certain amount of regeneration of the epithelium of the tubules had been seen after incision or after the relief of hydronephrosis. The principal aim of decompression was to save any kidney tissue which had survived the destructive action of back pressure, for a very little renal tissue was enough for healthy life. The careful relief of decompression was accompanied by the disappearance of symptoms, but haphazard methods would not give uniformly satisfactory results. The van Zwalenburg method allowed the urine to trickle into a receptacle adjusted at the right level above the bed, and took two to eight days to empty the bladder. It was not safe to withdraw small amounts every few hours or to empty the bladder and partly refill it with some solution; both these methods produced sudden decompression.

Sudden relief of pressure on the liver was not so risky as sudden emptying of the bladder, since back pressure acted more slowly and less gravely on the cells of the liver. Nevertheless, sudden decompression sometimes caused cessation of hepatic function. Hepatic shock and insufficiency were not properly understood, but it was known that liver cells possessed a high degree of recuperative power and that measures for gradual vascular decompression—e.g., the Talma Morison operation—stimulated this recovery. Slow drainage of the gall-bladder or common duct in cases of biliary obstruction permitted this regeneration. Pressure causing loss of function was revealed by the appearance of white bile. When sudden operative decompression caused liver shock there was sometimes a free flow of bile, followed later by cessation and symptoms resembling those of uræmia.

ASCITES AND INTESTINAL OBSTRUCTION.

Even modern methods of withdrawing fluid from the abdomen were sometimes followed by cachexia, syncope, or hæmorrhage into the intestines and abdominal walls. Jaundice and grave nervous symptoms had been known to follow paracentesis in cases of cirrhosis. Since it was impossible to foresee these serious symptoms, the only safe course was to provide for very gradual decompression.

The gradual reduction of pressure in the distended large intestine, induced by preliminary drainage, probably accomplished far more than mere relief of toxæmia and restoration of the tone of the bowel and the size of its lumen. The intestine might show more repair after decompression than we yet knew of. In acute cases there was still a high mortality, and many suggestions had been put forward to account for this. Sir William Wheeler felt that, in his experience, acute cases did best when a slow, steady drain could be established through a small tube. Rapid drainage through a Paul's tube might be followed by deplorable results with the clinical picture of general shock. The results were alway good if the obstruction could be relieved simply—by dividing a band, for instance—and the intestina contents evacuated naturally, but a small enterostom tube acting as a safety valve gave equally good result and was essential in all but the earliest cases.

EMPYEMA.

Any change of pressure on one side of th mediastinum was accompanied by an almost equa change on the other side. Aspiration and slo decompression of empyemata had reduced mortalit from 40 or 60 per cent. to 5 or 10 per cent. Whe intrathoracic pressure was high the intercosta spaces bulged and the mediastinum, liver, and dia phragm were displaced. If the pressure wer suddenly released the result might be an acut pulmonary œdema or a to-and-fro flapping of th mediastinum which affected blood æration an circulation, producing a condition of shock whic often caused death. The line of safety was to aspirat or drain with a catheter before evacuating, whethe the pressure was high or only moderately raised, o whether the infection was streptococcal and diffus or pneumococcal and associated with adhesion Occasionally simple aspiration was followed by fata collapse. This was probably not due to vagal refle as had been suggested, but to flapping mediastinum.

CEREBRO-SPINAL DISORDERS.

Lumbar puncture might do harm or even kill th patient when performed during high intracrania tension. This was often due to wedging of th bulb in the foramen magnum, with resulting anæmi and paralysis of the vital centres. Lumbar punctur was especially dangerous in cases of hydrocephal due to tumour, and often caused giddiness, headach nausea, vomiting, and rigidity of the neck muscle Ill-effects were, however, very seldom produce if a small-bore needle were used and the fluid with drawn very gradually, the decrease of pressure bein controlled by a manometer. Spinal compressio might be aggravated by lumbar puncture and th signs and symptoms become worse; this effect migh be of diagnostic advantage. In some cases the roo pain became more severe and in others modera motor and sensory disturbances were followed b complete paralysis. Analogous changes might b seen in cases of intracranial growth. Th diagnostic aid, however, demanded a price which migh be severe unless the amount of fluid and the rate o withdrawal were carefully controlled. Lumbar punc ture was of decided value in the treatment of acut anterior poliomyelitis and posterior basic meningiti but a sharp distinction, Sir William Wheele concluded, must be drawn between diagnost puncture, which was safe, and medical decompressio which might be dangerous.

THE CANCER HOSPITAL, FULHAM.—Last year ther were 1162 new in-patients and 1557 new out-patient a substantial increase in each class. These larger numbe are to some extent accounted for by the work don with radium, cases being received for much short periods, and many more operations being performed, ar to the gradual education of the public in the importan of seeking expert advice in the early stages of diseas Although the hospital at present remains entirely fre "some means of encouraging, if not actually invitin patients to contribute as far as possible may," the repo says, "before long be devised." The hospital has bee using radium since 1903. The new buildings for the ele trical and radiotherapeutic department will cost £93,00 without counting equipment, instruments, appliances, & The appeal to the public has so far produced £17,500.

MEDICINE AND THE LAW.

Miners' Nystagmus and Compensation.

ANY general system of insurance against, or ompensation for, accident and ill-health demands good ith. In particular the provisions of the Workmen's ompensation Act which treat certain industrial seases as accidents of the employment must protect ie employer against liability where all-important formation has been suppressed or false information eliberately given. Thus Section 43 of the Act eclares that compensation shall not be payable "if is proved that the workman has at the time of ntering the employment wilfully and falsely presented himself in writing as not having previously ffered from the disease." The principle is simple ough but occasionally there is doubt whether the ate of the false representation synchronised with the ate of entering the employment. Where work is termittent, difficulty arises; the House of Lords d a difficult case of this nature to examine lately. he disease was miners' nystagmus. The first relevant ct in the workman's history was that in 1895, hen disabled by the disease, he finally settled his aim against his then employers for a lump sum yment. His subsequent work was done for a fferent firm of coalmasters by whom he was employed the following intervals. He first worked for them March, 1926, then went to Canada, but came back them in April, 1927. Up to this point he had made declaration. A few days later, however, he nt to another section of the colliery where, in his rk as a miner and brusher, he came under a different ushing contractor. He then made a written eclaration (found to have been wilfully and falsely ade) that he had at no time suffered from miners' ystagmus. Trade became slack and he was paid f in July and thereupon received unemployment surance benefit; he came back in August (under ie same contractor) and was paid off again September. On Nov. 7th (1927) he came back ice more and again made the false declaration. e remained at work till April, 1928; he made the eclaration a third time when he worked one shift a date in May. Otherwise he remained in receipt benefit till June 15th, from which date he worked ll August 26th. A few days later he was certified disabled by miners' nystagmus as from August 26th; has since remained totally incapacitated from that use. The Scottish tribunal of first instance warded him compensation, the arbitrator considering ie man to have been continuously employed from pril 27th, 1927, down to August 26th, 1928, except r the periods when unemployment was temporarily ie to bad trade. As no declaration had been ade on April 27th, the arbitrator saw no obstacle the award of compensation. Was this decision as the continuity of employment from April, 1927, wards a decision of fact which could not be disturbed n appeal? The Court of Session felt itself able to -open the matter and the House of Lords has nfirmed that Court's view. Under the Act the dustrial disease may be referred to any employment uring the previous 12 months; compensation is coverable from the latest employer, but the latest nployer may join up a former employer in whose eriod of employment the disease is proved to have een contracted; if the disease is of a gradual haracter, each of the successive employers must bear s share of liability in the proportion determined by ie arbitrator. In this sense employment for the previous 12 months is looked upon as one employment. This being so, the House of Lords decided that the employment which extended during the final 12 months before the certificate of disablement was the employment which began on Nov. 7th, 1927. The workman's entry into employment on that day synchronised with one of his false declarations; consequently, no compensation was payable.

The merely ethical view of the case (under which it would make little difference whether the false representation was made in November or a month earlier or later) is immaterial. The popular view may welcome adequate compensation and proper medical treatment for a miner suffering from nystagmus, but may grudge him the power to capitalise his total incapacity at frequent intervals at the expense of successive employers. Medical opinion may regret that significant information of the previous history of a specific industrial disease should be so easily hidden. If the recent case under discussion is not to be repeated, frequent medical examination of workmen and an elaborate system of filing their personal records might be of assistance. But employers deprecate the regimentation of industry, and workmen would have a right to resent the calendaring of personal details suggestive of the finger-print system of Scotland Yard.

Dangerous Drugs.

Geoffrey Bradford Wilmer, otherwise Melville, pleaded guilty at Maidenhead police-court on August 27th to six summonses under the Dangerous Drugs Consolidated Regulations charging him with unlawful possession of 300 tablets containing diamorphine chloride. He had been arrested at Northampton on a warrant issued last December, when a medical practitioner was convicted of offences under the Dangerous Drugs Acts. Wilmer, it was stated, had obtained the heroin from a duly qualified chemist in Maidenhead on the faith of prescriptions signed by Starkie, a London doctor whose name was removed from the Medical Register in 1922, a fact of which Wilmer was well aware. Wilmer made a long statement to the bench; subsequently Chief Inspector Prothero gave the court such information as the police had ascertained. Wilmer, he said, had represented himself as Major Wilmer and as Major Melville; he had also been known as Captain Nicholls and, at Melton Mowbray, as Captain Carter. Wilmer denied having used these names; he produced a bill for 170 guineas for medical treatment on which he was apparently described as Captain Arnold. The police-inspector stated that Wilmer claimed to have been an officer in the Essex Regiment, retired with the honorary rank of captain, and to have received shrapnel injuries in the war. He had not, in fact, been wounded in the war; he held no honorary rank as an officer, but was an imposter. The magistrates sentenced Wilmer to six months' imprisonment.

When the strict regulation of the possession and supply of drugs is taken into account it may seem surprising that it was possible for a man like the accused to be in possession of a considerable supply. In another case, disposed of at Wolverhampton some days ago, a medical practitioner who had become a drug addict was stated to have been supplied during a period of 11 months with 484½ gr. of cocaine, 825½ gr. of morphine, and 1912 drachms of liquid morphine. A doctor, by virtue of the general authorisation under the statute and statutory regulations, can, if he cares to abuse his authority, obtain supplies from different chemists by representing that the drugs are required for dispensing purposes. But a layman

like Wilmer has no such opportunity. The explanation in Wilmer's case is twofold. From statements made by Wilmer to the police, it appears that Dr. Starkie furnished him with a number of signed sheets of notepaper in blank; when Wilmer wanted a drug he filled up the sheet, which thus became a prescription. Wilmer also stated that, by an understanding with Dr. Starkie, he took whatever heroin he required out of drugs obtained on prescriptions in the name of a Mrs. Melville. A chemist, to whom the prescriptions were presented, was unaware that Dr. Starkie was an unregistered practitioner; he took the very proper precaution of communicating with him by letter and by telephone, but was reassured by the answers he received. The second explanation of Wilmer's success in obtaining supplies was that a chemist, again very properly, traced Dr. Starkie's name in the Medical Register, but in a copy for the year 1921 (before the name had been removed). Where chemists have taken such precautions it is certain that no magistrate or judge would encourage the taking of proceedings against them under the Dangerous Drugs Acts and Regulations; the police, therefore, are unlikely to initiate such proceedings. But the incident suggests the question whether it is part of a chemist's duty to possess an up-to-date copy of the Medical Register. It also suggests the further question whether the police, who apparently had had Wilmer's movements and purchases under observation for some time, do all that they can to warn chemists in any neighbourhood where a known drug addict is suspected of breaking the law. Though the facts in Wilmer's case do not justify the suggestion, there is sometimes a popular impression that the police are more anxious to accumulate evidence for a substantial conviction than to prevent the commission of crime. This impression will not be removed by the allegations in another case a few days ago where a man, described as a laundry canvasser, pleaded guilty to unauthorised possession of 56 g. of cocaine. The detective-inspector on that occasion had admittedly posed as a dentist; he had apparently said he was a sleeping partner in a firm of dentists, had produced £32 in notes, and announced that he could do with half a pound of the drug. Mr. Cairns, in passing sentence of three months' imprisonment, remarked that he would have imposed the maximum of 12 months if the circumstances had been different. Though full allowance must be made for the difficulties of suppressing the drug traffic, the magistrate may have shared the popular distaste for a situation created by a member of an English police-force turning himself into an *agent provocateur*. The restrictions on the supply and possession of dangerous drugs will not easily be enforced without the willing coöperation of medical practitioners or dental and veterinary surgeons. That coöperation will be more smoothly secured if their respective professions are not peopled with imaginary rascals created by the romantic inventiveness of the guardians of law and order.

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.—In 1929 this hospital admitted a record number of in-patients—7247—whose average cost was £6 5*s.* 10*d.*, and there were 29,348 new out-patients. At £67,200 the income increased by £13,153, most of which was accounted for by larger legacies and an increase of over £3000 in receipts from the Hospital Saving Association. The expenditure was £60,319. The special clinics for rheumatism and asthma have proved most valuable; a new department devoted to guidance in matters of child welfare has also been started. Increasing demands upon the hospital have satisfied the board of management that the project of reconstruction cannot longer be delayed.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

OVERCROWDING OF THE MEDICAL PROFESSION IN FRANCE.

YOU have already noticed[1] the warning given s frankly and wittily by Prof. Carrière, of Lille. A report recently presented by Dr. Léon Bizard an Dr. Xavier Colaneri to the *Fédération des Groupe ments Médicaux* of the Paris area shows how startlingl rapid have been the changes which have produced crisis in the medical profession in France, owin to the great increase in the numbers of medica students and doctors. In 28 years the number o doctors has increased by 10,685, whereas the tot population of the country has increased by onl two millions in the same period. In the four-yea period 1925–28 there has been an increase o 3350 doctors, Paris and its suburbs alone havin been presented with more than a thousand new medica practitioners. Two main factors are held responsibl for this abundant invasion of the medical professio by new recruits. The first is the great attractio which the profession of medicine now has for women in 1929 as many as 2730 women registered as medica students, the corresponding number of male student being 10,650. The other factor is the great number o foreigners who join the medical profession in Franc Yet another factor is playing an important par though its influence is difficult to assess in figure It is the army of ancillary practitioners; nurses mal and nurses female, masseurs and masseuses, so disant auxiliaries who yesterday were the assistant of medical practitioners, and to-day are often the competitors.

Dr. Bizard and Dr. Colaneri propose severa remedies for a state of affairs which they conside deplorable. They recommend the addressing by competent authority of a circular to parents, scholar and teachers, stating the material and other obstacle at present obstructing the medical curriculum an profession. Doctors with university contracts woul do well to give addresses on this subject in the schoo of the country. An educational campaign woul also be useful in guiding medical students into by paths of the medical profession which are apt to b neglected, although profitable. Dentistry for doctor and the colonial medical profession are two suc by-paths, the following of which would do somethin to relieve the present congestion in the large towns i France. A measure which would be rapidly effectiv in reducing the number of entrants to the medica profession would be to put up a barrage at th examinations. It is pointed out that in the Facult of Law more than 30 per cent. of the examinee fail to satisfy their examiners, and the commo tendency for these 30 per cent. odd to find consolatio for their rejection in sweeping wholesale into th medical profession should be discouraged by raisin the standard of the medical examinations. If a medical students had to submit to a written anony mous examination, and were obliged to abandon thei medical studies after failing to pass their medica examinations on two or three occasions, the doubl purpose would be served of lessening the congestio and competition among doctors and of saving th public from an inferior class of practitioner. It i also hinted that candidates for a degree in medicin should undergo a medical examination, so that th

[1] THE LANCET, 1930, i., 1438.

uld-be practitioner too deaf to auscultate a patient uld be eliminated. It will be seen from the above narks that the dangers of a medical proletariat d other bogies in the medical profession in France e to a great extent those which face it in many other rts of the world.

THE PASSING OF THE OFFICIAL BROTHEL.

While one civilised nation after another has aban-ned the official regulation of prostitution, finding i so-called advantages a snare and a delusion, lance is still officially pledged to this system. It ay not be so for long. Indeed, there are already signs a revolt against it, in the provinces at any rate. Grenoble, for example, the municipal authorities lve just decided to abolish the regulation of prostitu-n, and to shut the *maisons de tolérance* as from n. 1st next. Behind this official decision is the rk of one man, Dr. Hermite, hospital surgeon d social worker, whose recent report to the municipal thorities showed in no uncertain terms what can be ne by a system of free consultations carefully ganised. During 1926 and 1927, and before his stem of free out-patient consultations was started, te antivenereal service registered 691 male and 481 fnale consultations. During 1928 and 1929, after fe out-patient consultations were started, the number c male consultations rose to 8449, and the number cfemale consultations to 4369.

HEALTH INSURANCE AND THE MEDICAL PROFESSION.

The medical profession in France has followed vth not a little anxiety the development of social i urance in general, and that of the law of April 30th, 30, in particular. The French medical profession is, ifact, only now beginning to face that problem which vs more or less solved in England before the war, d at a still earlier date in Germany. Late in July te Confederation of the Medical Syndicates held a reeting in Paris to discuss the attitude of the medical pofession to the new law. Dr. Dibos, who has seceeded Prof. Balthazard as President of the Con-fleration, was in the chair. Much dissatisfaction vs expressed by various speakers at the conditions vder which the medical profession would be obliged t work under the new law. It was, however, finally greed by a vote of 13,001 to 1668 to collaborate *citre d'essai* with the Government and all concerned i carrying out the provisions of the new law. Thus, vile pledging itself to act in a civic spirit as far as ossible, the medical profession reserves to itself the ht to reconsider the whole question should necessity se.

WIRELESS CAMPAIGN AGAINST VENEREAL DISEASE.

How times have changed since the use of the word philis was forbidden in French telegrams! That terprising broacasting station, Radio-Paris, has ently appointed a Social Hygiene Committee, sided over by Prof. Roger, and including such ll-known names as those of Profs. Balthazard, lon Bernard, Jean-Louis Faure, Gougerot, Marcel bbé, Roussy, Tanon, Weill-Hallé, Chailley-Bert, utier and others. Prof. Gougerot opened a series lectures on venereal disease, the titles of his narks being: "What is Syphilis?" and "The ngers of Undetected Syphilis." The reaction the French public to this daring innovation was aited with considerable interest. Three letters of postulation were addressed to Radio-Paris on this bject. But as hundreds of letters of approval were aultaneously received, it is safe to assume that this ucational scheme will be followed in its entirety.

THE BREEDING OF RAT-CATCHING CATS.

It is a curious fact that while for generations we have bred horses for speed and hens for laying, no one has systematically attempted to bring out and intensify by selective breeding the rat-catching qualities of cats. It is an extraordinary omission when one comes to think of it. A cat in whom the sight of a rat arouses no fiercer emotion than a mild and philosophical curiosity is almost unthinkable. Yet such has been the misconceived breeding of cats to fit them rather for the requirements of companionless elderly spinsters than for the destruction of rats, that a rat-indifferent or even a rat-fearing cat is now no uncommon sight. In view of these considerations it is reassuring to learn that the *Club pour les Chats Ratiers* of Havre has undertaken to organise a cat farm, the principal object of which is to breed genuine rat-catching cats. Dr. Loir, Medical Officer of Health for Havre, has already for four years been breeding cats for this purpose, and the port authorities and other interested bodies are contributing to the expenses of this undertaking, the results of which will be awaited with much interest by all concerned in the exterminination of rats.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

HEALTH PROGRESS IN DUBLIN.

FOR the past half dozen years or so the ordinary municipal government of Dublin has been in suspense, and its functions have been performed by three Commissioners, appointed by the Government, one of the three being a medical man. Recent legislation has, however, made drastic changes in the municipal government of the metropolitan area. The city of Dublin is now to be joined in a "greater Dublin" with the suburban townships of Rathmines and Pembroke, while the seaside townships are to be amalgamated into a coastal borough, with its centre at Dunlaoghaire (Kingstown). Elections for the councils of these two boroughs are to take place very soon and, consequent on the establishment of the council of the new Dublin, the rule of the City commissioners will cease. Their chairman, Mr. Seumas Murphy, has taken the occasion to give to the press a summary of the work accomplished by himself and his colleagues since they took office in 1924. As regards its effect on the public health there is a record of sound and enduring work. The water-supply of the city has been increased, and a greater pressure made available in order to safeguard the supply to the higher areas on the north side of the city. Not only have the road surfaces throughout the city been improved, but modern methods of street cleansing have been introduced. As regards housing, a large programme has been carried out by Dr. Dwyer, the medical commissioner. When the Commissioners took control the number of corporation houses was 2279, whereas the number at present is 5992. The annual rental has increased from some £43,000 to £160,000. Over 900 more houses are in course of construction, and schemes are on foot for an additional 777. The staff for dealing with the inspection of meat has been increased, and the inspection itself, both for home use and for export, is thorough. A new city laboratory has been constructed and thoroughly equipped. There has been a great development of infant welfare work, with a gratifying decrease in infant mortality. Children's clinics have been

established, as also antenatal clinics, dental clinics, and violet-ray clinics, and a diphtheria immunisation clinic. A system of medical inspection of school-children was established in 1928 and in two years some 25,000 children have been examined. The record is one of which the Commissioners have every reason to be proud. It has always been recognised that the rule by commissioners must be a temporary phase in the history of Dublin, but it has been a fortunate period for the citizens.

SWIFT'S ASYLUM.

Another step of progress has been made by the governors of St. Patrick's Hospital, commonly known as "Swift's Asylum," in the opening last week of a new wing by the Governor-General. The hospital was founded in 1745 under the will of Dean Swift, who left almost all his property for the purpose. As he put it in verse some five years earlier:—

> "He gave the little wealth he had
> To build a house for fools, or mad,
> And showed, by one satiric touch,
> No nation wanted it so much."

As a matter of fact it was the first hospital for the insane to be founded in Ireland, and it remained the only one for some 70 years. The institution has always kept abreast of the best knowledge of the treatment of the insane and, like most other institutions of the kind, it has undergone great development in the last 30 years, during which time it has been under the medical superintendence of Dr. R. R. Leeper. In recent years a country branch has be established in a beautiful country house near Luc some half dozen miles from Dublin. The Govern General, in declaring the new wing open, expres his confidence that the hospital would continue preserve the eighteenth century traditions of charita helpfulness and of sympathetic efficiency, and th the governors would always, as now, recogn professional efficiency by removing obstructions to t application of steadily advancing medical knowled

THE MENTALLY DEFICIENT IN IRELAND.

At a meeting of the Dublin Rotary Club last we Mr. John Cooke, who has been for many ye honorary secretary of the Dublin Branch of t National Society for the Prevention of Cruelty Children, gave an address on "Feeble-mind Children," in which he pleaded strongly for legislati on behalf of this class in Ireland. He pointed o that the investigations of the Royal Commissi of 1906 had been followed by ameliorative Acts Great Britain, which were not made to apply Ireland, although the need was relatively grea in Ireland. In the Irish Free State there were t two institutions for the care of feeble-minded childr Throughout the country, hitherto, numbers had be consigned to the workhouses, where accommodati and treatment were of necessity inadequate, or to t asylums. There were no arrangements for the separa teaching of these children, and hence the necessa educational treatment they should receive formed part in the training of the teachers.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of six counties:—

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Hampshire .. (432,600)	16·5	12·7	0·77	1·43	2·2	2·7	56	28	3·7
Norfolk .. (322,990)	15·4	13·4	0·76	1·67	2·3	2·4	60	22	4·4
Leicestershire (295,300)	17·0	12·3	0·99	1·37	2·4	2·0	57	35	4·8
Northampton-shire .. (216,500)	14·3	12·2	0·83	1·50	1·8	2·3	55	19	4·8
Cumberland (208,720)	17·7	13·3	0·88	1·48	2·6	2·4	74	34	3·8
Holland .. (89,400)	19·4	13·1	0·67	1·59	2·3	1·8	63	24	3·4

Stillbirths per 100 live births: Hampshire 3·7, Leicestershire 3·6, Northamptonshire 3·2, Cumberland 3·6.

Hampshire.

Dr. H. Leslie Cronk shows that most of the districts in the county are still served by medical officers of health who are engaged in private practice, so that the Local Government Act, 1929, with the consequent redistribution of county districts, will entail great changes by the appointment of whole-time medical officers of health and also by the abolition of the combined appointment of sanitary inspector a surveyor. The County Council will be able to tak hand in the provision of satisfactory water-suppl and drainage for small districts which at pres lack such. It already does useful work under t Housing of Rural Workers Act.

Changes have been made in the scheme un which expectant mothers when booking midwi can insure against the need for medical help. first pregnancies the premium is raised to 7*s.* 6*d.* a the insurance does not become effective until c month after the payment of the premium. T midwives attended 78 per cent. of the confinemen The percentage of calls for medical help was 42 insured and 28 for uninsured cases. The net c to the Council for each insured case was 7*s.*, and each uninsured 4*s.* 8*d.*, and the total net cost w £1684. Experience in Winchester has shown that t maternity beds needed for emergency and abnorm cases are approximately equal, and the beds need for these two groups are estimated at 44. T 40 abnormal cases admitted into the Hampsh County Hospital, Winchester, were: 22 of dispropo tion, 5 of toxæmia, 3 of antepartum hæmorrha and 10 others. All the mothers did well, but 4 the children were stillborn. The 47 emergency ca admitted to the same hospital were 19 of toxæm 13 of obstructed labour, 10 of antepartum hæmorrha and 5 others. One mother died and the remain did well. Of the toxæmia births, 8 were stillbo (2 macerated); of the obstructed labours, 7 we stillborn; and of the antepartum hæmorrhage, 5 we stillborn. The septic cases admitted under t Council's scheme numbered 29, of which 23 we received into the special isolation block of the Coun Hospital, and 6 to three other hospitals. New arrang ments are in progress with regard to the four group of cases—namely, normal cases, where t home conditions are unsatisfactory. The services an approved consultant were asked for in ten cases

uerperal pyrexia and fever, six of whom were mitted to hospital. An investigation of the after-stories of cases of ophthalmia neonatorum, notified uring the last two years, shows that in 1928 one ild was blinded in one eye and one in both eyes, id that in 1929 one child was blinded in one eye id two children in both eyes.

Dr. Cronk is doubtful as to whether a campaign r immunisation of children against diphtheria ould be pushed, but he thinks that general prac-tioners should be in a position to offer immunisation those who desire it. A summary is given of the olation hospitals provided by the 17 urban and rural districts, and a scheme has been prepared for e elimination of unsatisfactory small hospitals and e concentration of beds in as few centres as possible.

There are in the county 2800 producers of milk. here is no routine veterinary inspection of the dairy rds, and the taking of milk samples for the discovery tuberculous udders has not passed the experimental age.

Norfolk.

Dr. T. Ruddock West states that it is hoped during 30 to establish a comprehensive maternity and ild welfare scheme, including health visiting and idwifery services, throughout the county. The mber of parishes without a midwife in 1929 was 6, as compared with 186 in 1928. The births in e county numbered 4967. Midwives attended out half—1221 in their capacity as midwives and 85 as maternity nurses.

In July, 1929, the medical, dental, and nursing aff of the school medical service were transferred to e public health department, and as the clerical staff as transferred in the previous year, the unification the public health service is now complete. The ublic health committee has approved a scheme for e provision of isolation hospitals. The County ouncil already owns a site of 14 acres at East reham, with drainage, water-supply, electric light, s, and land for extensions available, and a hospital ill be erected on this site, which will provide for all stricts at present without accommodation. The ovision to be made for small-pox is still under nsideration.

Under the orthopædic scheme there are two inspec-on clinics—at Norwich and King's Lynn—con-ucted by the orthopædic surgeon, Mr. M. W. Bulman. he doubling of the cases seen as compared with the evious year shows that ascertainment is improving. reatment clinics would be difficult to establish in is thinly populated county, and the treatment is at esent given in the home by the (whole-time) ortho-edic nurse, Miss J. E. Kemp, under the instructions the orthopædic surgeon. The County Council ntributes towards the apparatus required. At the d of the year there were 126 pre-school-children on e register, including 69 cases of rickets and 28 of ngenital deformities. The tuberculosis officers use e services of orthopædic nurse, and call in the thopædic surgeon when required. Twenty-two berculous children were using surgical apparatus at e end of the year. About 100 school-children also tended the two orthopædic clinics during the year. ort-stay hospital cases are accommodated at the nny Lind Hospital, Norwich, and long-stay cases the orthopædic hospitals at Pyrford and in London. There is a pressing need for accommodation for dvanced pulmonary and surgical tuberculosis, which is hoped will be met by the sanatorium to be tablished on the Stanninghall Estate of the County ouncil.

Leicestershire.

Dr. J. A. Fairer reports that an epidemic of small-ox began in July in the Shepshed and Ibstock stricts, spreading to the western side of the unty and to areas in the vicinity of Leicester. hicken-pox was prevalent at the same time and in e Shepshed district the first cases of small-pox hich occurred were not recognised for some weeks. he notifications received numbered 230, and there were no deaths. The two county hospitals were opened for the reception of patients in July and August respectively, and also admitted 62 cases from the city of Leicester. Of the 268 cases admitted, 246 had never been vaccinated, and among the vaccinated remainder there were no cases under the age of 35. There are three permanent and four temporary hospitals provided by the County Council for infectious diseases. Some of these are inadequately equipped and will be replaced by a combined sanatorium and isolation hospital to be erected at Markfield, in which there will be 54 beds for infectious diseases. In January the services of the county oculist, Dr. Constance Walters, were made available for pre-school children, and spectacles were prescribed for 11.

There were 362 notifications of diphtheria with 34 deaths, a case-fatality of 10·6. The deaths ascribed to influenza were 81 in the urban areas with a population of 120,900, and 156 in the rural areas with a population of 174,400. There are now 42 maternity and child welfare centres under the auspices of the County Council, as compared with 18 ten years ago, but antenatal work is only just beginning. The births numbered 5013, and the two antenatal clinics were attended by 39 and 53 mothers respectively. There are three hospitals and five out-patient clinics available for orthopædic work, but the need is pointed out for more systematic organisation in order to obtain continuity and to avoid over-lapping. Dr. H. J. Blakesley, who conducts the male V.D. clinic at Leicester Infirmary, reports a serious outbreak of virulent syphilis—there being 82 cases in the primary stage as compared with an average of about 15 for the past three years. Most of the cases showed a virulent form of actively infective organisms in addition to the spirochæte.

The River Soar was in a very polluted condition during 1929, owing partly to the excessive drought.

Northamptonshire.

Dr. J. M. Mackintosh took over the duties on Jan. 1st, 1930, following on the resignation of Dr. L. Meredith Davies in November, while Dr. Lila S. Greig acted during the interim. The report shows that the notification of births is incomplete. Of the 3104 live births, 242 were unnotified and of the 98 stillbirths only 61 were notified. Of 128 infant deaths investigated by the health visitors 77 died in the first month and 43 of the 77 were said to be prematurely born. In addition to the 15 maternal deaths, which make up the rate of 4·8, 6 other deaths investigated (on behalf of the Ministry) were associated with childbirth, one being a death from pelvic peritonitis due to attempted abortion. There were 14 cases of puerperal fever and 30 of puerperal pyrexia. In some cases the illness appeared to be concurrent only with the puerperium, and in one case infection was possibly due to a douche of milk and water given by a handywoman. Hospitals in Kettering, Stamford, Rugby, and Northampton are available for these cases and the same hospitals with the addition of the Warwickshire County Maternity Home for confinement cases. The last-named cases, numbering 48 during 1929, are those with unsuitable home accommodation and those whose confinement is likely to be abnormal.

Orthopædic treatment is provided in the county by the Manfield Hospital with its several out-patient centres. There were 29 known cases of small-pox with no deaths and 227 cases of diphtheria with a case-fatality of 5·7 per cent. There is a decrease in the attendances at the tuberculosis dispensaries but a large increase in the number of patients visited at home in consultation by the tuberculosis officer. The situation as to the examination of contacts is unsatisfactory. Young children are brought up by their parents, but young adults from 15 years onwards cannot be induced to attend. A very high proportion of pulmonary cases are only notified when hopelessly ill, and the hospital accommodation for advanced cases is quite insufficient. The tuberculosis officer,

Dr. G. B. Lord, also asks for hospital beds to enable artificial pneumothorax to be carried out satisfactorily.

Cumberland.

Dr. F. H. Morison says the noteworthy feature of 1929 was the fact that for the first time a complete maternity and child welfare scheme was put before and accepted by the County Council and only awaited the sanction of the Ministry of Health. Cumberland relatively to population, has made more use of the Housing (Rural Workers) Act than most counties. Forty-three applications have been received since last year and grants were sanctioned in every case. One application was subsequently withdrawn. The total assistance promised since the inception of the Act has amounted to £6745, about half of which has been already paid in respect of 67 dwellings.

Mr. R. Simpson, F.R.C.V.S., makes his second annual report on the inspection of the dairy herds. An increase of the veterinary staff has been sanctioned as it has not been possible to get round all the herds on the register. No opportunity is lost to educate producers not only in the hygiene of cattle but in the production of clean milk. Six outside complaints of tuberculous milk were received and three notices as to tuberculous milk in the county. In the investigation of these nine cases, the offending cow was discovered at the first examination in six instances. In one case the cow involved was detected and slaughtered in the district of another local authority. In the eighth case the result was negative, probably owing to the sale of cows, and in the ninth case the sample was from a large milk depôt which derived supplies from other counties and a negative result was obtained in the three Cumberland farms involved. The County Council have also instituted routine bulk sampling of milk in order to test for cleanliness and the presence of tubercle. Two hundred such samples were taken of which one-third reached the rather low standard for cleanliness, and three samples (1·5 per cent.) were tuberculous. The cows discovered and slaughtered with tubercle of the udder numbered 19, those with tuberculous emaciation 58, and those with other definite signs 66. Two cowkeepers were fined £5 each for failing to notify tubercle of the udder in an advanced stage, and another owner was fined £10 for failing to report a cow with advanced generalised tuberculosis. Mr. Simpson is of opinion that all the duties in connexion with designated milk should be carried out by the local authority.

Dr. Morison again complains of the inadequate arrangements and equipment of the V.D. clinics held at the Cumberland Infirmary, Carlisle, and at the Whitehaven and West Cumberland Hospital.

Holland.

Dr. H. C. Jennings shows that influenza affected the statistics adversely. The death-rate was 1·9 more than in 1928, and the infant mortality-rate 17 higher. Boston Borough had an infant-rate of 103 and Boston Rural one of 84. Diphtheria was more prevalent and 158 out of the 206 cases occurred in Boston and neighbourhood with 11 deaths. One of the 13 survivors from ophthalmia neonatorum suffered impairment of vision. Orthopædic clinics are to be held in the county in order to save the long journeys of patients to outside hospitals. The tuberculosis-rate was lower than ever before, but the rate in Boston is double that for the rest of the county. The dispensary is successful in securing the attendance of contacts for examination, and there are 30 open-air shelters loaned out to patients. Inquiries were made as to four confinements attended by unqualified women, and the need for a midwifery service subsidised by the County Council in the sparsely populated districts is pointed out.

On the night of Nov. 12th to 13th huge quantities of dead and dying fish passed down the River Witham as the result of gross pollution from the sugar beet factory at Bardney. The proprietors of the factory were prosecuted and fined £50, and it is understood that the effluents are to be treate according to the most modern practice in order t prevent recurrence. In January, 1929, a region water committee was formed, and as a result a schem for the water-supply of the whole district at a cost £320,000 has been prepared by Sir Alexander Binnie Son, and Deacon. A report by the county M.O.H. dated Sept. 5th, 1929, shows the water-supply Boston to be grossly polluted. At that date th beck supplying the storage reservoir had been dr since June and the reservoir had become a pond stagnant water. The new supply is to be derive chiefly from the Bourne springs which are borehole sunk into a bed of the lower oolite, known locally a Lincolnshire limestone. Additional pumping plan will be needed to increase the supply from thes boreholes.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDE AUGUST 23RD, 1930.

Notifications.—The following cases of infectiou disease were notified during the week:—Small-pox 93 (last week 95); scarlet fever, 1471; diphtheria 953; enteric fever, 67; pneumonia, 474; puerper fever, 52; puerperal pyrexia, 97; cerebro-spina fever, 13; acute poliomyelitis, 15; encephaliti lethargica, 6; dysentery, 4; ophthalmia nec natorum, 101. No case of cholera, plague, or typhu fever was notified during the week.

The number of cases in the Infectious Hospitals of th London County Council on August 26th–27th was a follows:—Small-pox, 209 under treatment, 4 under observa tion (last week 183 and 3 respectively); scarlet feve 1632; diphtheria, 1810; enteric fever, 32; measles, 157 whooping-cough, 84; puerperal fever, 17 (plus 7 babies) encephalitis lethargica, 119; "other diseases," 25. A St. Margaret's Hospital there were 13 babies (plus 9 mother with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, includin London, there was no death from small-pox, 3 (0) fro enteric fever, 5 (0) from measles, 2 (0) from scarle fever, 11 (1) from whooping-cough, 28 (11) fro diphtheria, 45 (13) from diarrhœa and enteritis unde two years, and 19 (1) from influenza. The figures i parentheses are those for London itself.

The deaths from enteric fever outside London occurre at Birmingham, Nottingham, and Oldham. No great tow reported more than 1 death from measles or whooping-coug Liverpool reported 3 deaths from diphtheria. Diarrhœ was responsible for 9 deaths at Liverpool, 3 each at Birmin ham and Manchester.

The number of stillbirths notified during the wee was 292 (corresponding to a rate of 42 per 100 births), including 49 in London.

ST GEORGE'S HOSPITAL.—The annual repo of this hospital records that 5120 in-patients we treated last year. Their average stay was 22 days, and the cost £15 0*s.* 8*d.* each. The 39,432 new out-patients co 7*s.* 1*d.* per head. There were 250 births and 4286 oper tions, and 733 discharged patients were sent to Atkinso Morley's Convalescent Hospital at Wimbledon. A ver large increase is reported in the work of the electrother peutic department. The income was £85,492 and th expenditure £86,483. The cost of maintenance is now mo than double that of 1913.

THE NEW BETHLEM HOSPITAL.—In his annua report Sir Lionel Faudel-Phillips, the treasurer of th Royal Hospitals of Bridewell and Bethlem, states tha the completion of the transfer of patients and the ope ing of the new buildings at Monk's Orchard will be a accomplished fact in the course of next month. Last ye there were 416 patients, a smaller number than usua because of the decision to close the hospital at Lambeth new admissions before the reopening at Monk's Orchar The average weekly cost per patient on ordinary expenditu was £4 13*s.* 9*d.*, but of the total cost (£46,312) £15,073 w provided by payments for patients varying from 2 to guineas a week; 20 per cent. of the patients are on th free list.

CORRESPONDENCE

ULFOSIN THERAPY IN GENERAL PARALYSIS OF THE INSANE.

To the Editor of THE LANCET.

SIR,—Patterson and Switzer [1] have reported on ulfosin Therapy in General Paralysis of the Insane, d they think that they did not obtain such a arked pyrexia as was to be expected according to hroeder's paper. To this I may say that it seems take some experience to obtain a maximal tempera- re with this treatment. For it has happened over d over again that physicians have written to me this respect when they were first taking up the lfosin treatment, but later, when I have instructed em in details on this point, they have always been tisfied with the results they obtained. It is my perience that the most favourable and reliable lfosin effect is obtained by deep intramuscular jection—i.e., *supraperiosteally* on the lateral surface the femur—preferably after a brief heating over a all flame (alcohol burner), by which means the lfosin is dissolved completely. In this way I have ployed the sulfosin therapy in 14 cases of general ralysis, and in 100 per cent. of these cases I obtained emperature of or above 39° C. (102·2° F.), and in per cent. of the cases a temperature of or above ° C. (104° F.), leaving out the first two injections in ch series that were given as test injections for the justment of the dose.

In fact, the various authors who have worked with is therapy (Shilvock,[2] Harris,[3] Marcuse and allmann,[4] Stiefler,[4] Jacobson and Smith,[4] Insabato [4]) ve been satisfied with the pyrexia obtained—nay, 15 patients Armenise [5] did even obtain a temperature or above 40° C. (104° F.) in 13 cases (87 per cent.). The pyrexia obtained with the sulfosin treatment ay, therefore, be said to be satisfactory, and it bears ry well comparison with the pyrexia of the malaria erapy. In addition, some authors (Warstadt,[4] res [4]) have found that several cases which had oved refractory to the malaria therapy were sponding to the sulphur treatment.

Besides, the pyretic effects of the malaria and the lphur treatments may hardly be compared by a mple tabulation of the maximal temperatures btained. For the pyrexias are not identical in the alaria and the sulphur treatments. The temperature rve in the sulphur therapy differs considerably from e temperature curve in malaria therapy; in the lfosin therapy the rise of temperature is of shorter ration than the fall, which frequently runs a mittent course, giving an unusually wide curve that characteristic of the sulfosin effect. Indeed, it as been shown that the improvement in the humoral actions is more pronounced in the sulfosin therapy an in the malaria therapy.

As to the inconveniences in the sulfosin therapy, I all willingly admit that the reaction after the sulphur jection—in particular when it is effective—is companied by some pain at the site of injection. s a rule this pain does not set in immediately after e injection, but most frequently some hours later, may be not until the temperature begins to rise. Generally these pains subside fairly rapidly, but tenderness and pains may persist for some days. These symptoms are treated with hot compresses (or alcohol compress) or electrical thermos-pillow, later on with massage. There is a great deal of individual difference in the sensitiveness to these pains, which unfortunately appear to be unavoidable if a favourable therapeutic effect is to be obtained. I have met with these pains in the response to every one of all the sulphur preparations I have tried out, and I have attempted, but in vain, to eliminate them in various ways—for instance, by injecting cocaine together with the sulphur. I have arrived at the conclusion that these pains are to be accepted as indicating that the organism is responding to the treatment with the desired reaction. As a rule the patients put up with these pains placidly and look upon them as an unavoidable discomfort. For these pains are by no means unbearable. This is evident from the fact that I have treated children of all ages without having to discontinue the treatment on account of pains.

I am, Sir, yours faithfully,

KNUD SCHROEDER, M.D.,
Physician-in-Chief to the Odense Hospital.

Odense, August 29th, 1930. Denmark.

[1] Patterson, W. G., and Switzer, S. R. L., THE LANCET, ugust 16th, p. 348.
[2] Shilvock, W. H., THE LANCET, August 16th, p. 347.
[3] Harris, N. G., Ibid., 1930, i., 1068.
References, see Schroeder, K., ibid., 1929, ii., 1084.
[5] Armenise, D., Riv. di pat. nerv. e ment., 1930, xxxv., 326.

FATAL SYNCOPE FOLLOWING PERCAIN ANALGESIA.

To the Editor of THE LANCET.

SIR,—The following case of cardiac syncope during the induction stage of a percain intraspinal block should be recorded. A woman, aged 50, suffering from a very large multilocular ovarian cyst occupying the abdomen up to the costal margin, was given an injection of 14 c.cm. of 1 : 1500 percain in 0·5 per cent. saline, spec. grav. 1·003, between L1 and L2, and then placed in the prone position in order that the posterior roots should have a sufficient concentration of the drug. About three and a half minutes after being placed in this position she suddenly collapsed and died. She was turned on her back, the abdomen was opened, and the cyst punctured to relieve pressure on the diaphragm, and cardiac massage was performed with the usual restorative measures, but without success. The post-mortem examination revealed nothing remarkable in the heart.

This case shows without doubt that any attempt at the prone position in such cases is a tactical error. The weight of the trunk must very greatly increase abdominal pressure, and the contents may be thrust upwards against the diaphragm and pericardium. Furthermore, it is possible that the great vessels may be pressed between the spinal column and the tumour with great embarrassment to the circulation. It was the opinion of Dr. H. B. Weir, who conducted the autopsy, that the adverse mechanical conditions resulting in this case were the probable cause of the syncope. The amount of percain injected—between 0·009 and 0·01 g.—is so small that a general toxic effect can be excluded. One of the chief advantages of percain is that the amount required for spinal blocks is only a small fraction of the maximum dose permissible for infiltrations (0·2 g.).

The fall of blood pressure which occurs after spinal injections would be a contributory cause, especially in a case of this nature. For this type of case the prone position should, therefore, be abandoned, and

the patient may instead be kept for five minutes in each lateral position, with the head end of the table slightly lowered as a precaution. As percain injections are likely to prove useful in operative obstetrics, it is as well to remember that the gravid uterus presents a similar contra-indication to the prone position. With regard to normal administrations, the prone position has given rise to no difficulty, and a steadily increasing number of cases have been uniformly successful. No case has shown any involvement of cervical nerve roots.

I am, Sir, yours faithfully,

W. HOWARD JONES.

London, W., August 26th, 1930.

UNDESIGNATED PASTEURISED MILK.

To the Editor of THE LANCET.

SIR,—The annotation on milk-borne epidemics in your issue of August 16th (p. 359) mentions the pasteurisation of milk in Brighton. The one-third of Brighton's supply which I included as pasteurised is treated in every way as designated pasteurised milk would be. The pasteurisation is done not at the farm but by a few large distributors; thereafter the milk is bottled and capped before being handled, so that the risk of infection after pasteurisation is reduced to a minimum. This year infected milk from a farm was sent both to an urban area and to Brighton. An outbreak of scarlet fever resulted in the urban district, but not in Brighton; fortunately the Brighton supply was pasteurised by the retailer before distribution. This is a good practical example of the benefit of the process.

I quite agree with you that it would be better if all pasteurised milks were sold as designated milks, and when the public have realised the comparative safety of drinking pasteurised milk the retailers who pasteurise will sell their milk as designated milk. In the meantime the public, and indeed even doctors, are confused by the number of designated milks, and are not taught that the safest liquid milk from the point of view of tuberculosis and sore-throat infections is pasteurised milk.

I am, Sir, yours faithfully,

DUNCAN FORBES,
Medical Officer of Health, Brighton.

August 20th, 1930.

THE MEDICAL TREATMENT OF CANCER.

To the Editor of THE LANCET.

SIR,—We, in Liverpool, have long regretted Dr. Todd's somewhat—shall I say—irritating attitude in regard to our investigations, but we have endeavoured to treat him with every consideration, for we know—indeed he, himself, has stated this in print [1]—that he has felt that enough notice was not being taken of his publications. I am grateful to you, Sir, for tactfully correcting, in your leading article, the ridiculous insinuations which are contained in the following statement made by Dr. Todd: "This [Dr. Todd's] research *was commenced in 1925, shortly after the revival or rehabilitation* of the lead treatment of cancer was brought about at Liverpool. Lead is an old remedy for cancer; Ambroise Paré used it with success, and we (the plural used to include the team) have obtained some results from a modification of his method." (Italics mine.) Does Dr. Todd wish to imply that I have been guilty of plagiarism, and that he has followed Paré and not us? This would be a step forward in Dr. Todd's pretentions that his work is quite independent of ours. Admittedly, Dr. Todd *commenced his work three years after our first publication*, which was the result of many years previous research. An interval of three years can hardly be described as "shortly after," to use Dr. Todd's words. Nevertheless, Dr. Todd in his first paper in 1927, and in his larger publication in 1928 acknowledged what we had done. It will be noted that his first paper appeared in the fifth year after our first communication to THE LANCET.[2] In this interval of five years we had published many other papers and addresses.

I had no knowledge, any more than Dr. Todd had, of the various, generally very curious, uses of lead in the treatment of "cancer" and other diseases made by early writers until Thomas's paper in French (1928) was brought to my notice, although I have referred to the knowledge of lead poisoning in ancient times. Indeed, if I had it would have interested me not at all scientifically, for doubtless every element has at one time or another been applied empirically and some as panaceas for superficial lesions of all kinds. My reason for using lead was scientific and original, and will, I think, be so regarded by all fair minded persons. Must we, I would ask Dr. Todd, regard the Good Samaritan and other benevolent persons of olden days, who used alcohol as a lotion for wounds, as the pioneers of antiseptic surgery? However, those interested will see some of this ancient history set forth on pages 388 et seq. of our book "Some Aspects of the Cancer Problem." Perhaps this was the source of Dr. Todd's information. If so he seems to have missed, or failed to profit from, the introductory paragraphs to that section, which are as follows:—

> "The interest created by our work in the treatment of malignant disease with lead has led to a search through the literature, ancient and modern, to discover whether the remedy is a new one. The common fate, indeed, of all original work on a considerable scale is that it shall first be tested in respect of its value; then, if it be of proved worth, the literature from the time of the Ebers papyrus (circa 1500 B.C.) must be searched lest priority be claimed. This is right and proper, provided the historian has critical faculties." And the later sentence: "It does not appear that any indication was discovered of the special action of lead on malignant neoplasia until our own work was commenced in the year 1919; indeed, it may be stated with confidence that there is little in the literature to lead one to suppose that before the clinical work was started in Liverpool in 1920 any serious and scientific attempt had been made to treat malignant disease with lead."

I hope I shall never again be called upon to perform the distasteful task of meeting such a charge.

There are, too, certain matters of fact in Dr. Todd's paper and in your leading article on which I may be allowed, perhaps, to say a few words. From first to last we have advocated (the references can easily be found by anyone interested) the coincidental use of calcium and iodine. We have combined both of these in some of our preparations, and have always administered calcium lactate independently. A large supply of parathormone was sent to us from America soon after it had first been made, and we have used it in certain cases. So, too, with liver extract; for a long time we have employed this for the prevention and treatment of anæmia; and radiosterol we have used for infected cases. I do not know that we have especially referred to the last three in print, but they and other adjuvants, have been employed not only by ourselves but by others when there have been indications. We believe that any practical physician would consider the exhibition of the last-named preparations as merely incidental.

The serious manner in which the writer of the leading article deplores the present state of the general medical treatment of cancer fills me with

concern. Even without lead so much can be done to relieve many patients, and I thought such methods were common in practice. The suggestions made to surgeons by Dr. Todd, which are summarised in the last paragraph of your leader, are all included in our paper which was published in THE LANCET in 1922.

It is interesting to learn, however, that Dr. Todd has discovered the error he made in denouncing the combination of lead and radiotherapy,[3] which we advised in our first paper. On the publication of Dr. Todd's first communication I wrote to him privately to call his attention to the fact that the "decidua" is not the "trophoblast," as he appeared to think. In my opinion, there is no excuse for a repetition of an error. Again, what does Dr. Todd mean when he writes in his present paper, page 391, column 2: "In addition, we found that the normal fat-splitting enzyme of the blood, which was usually increased in late cancer, showed a diminution when the treatment was being effective." When he made this statement on a previous occasion I again wrote privately to inform him that the augmentation of the pancreatic enzyme by the serum of cancer patients is reduced, as first shown by Shaw-Mackenzie, not increased—as Dr. Todd says—and that the administration of lead to these cases tends to restore this activity to the normal, and this is especially evident when they are doing well. My colleagues, Prof. Lewis and Dr. Corran, have published papers on this subject.[3 4] In our opinion, Dr. Todd's statements concerning this matter are the converse of the true state of affairs. Further, it is unfortunate that Dr. Todd should select a calcium compound to produce acidosis for the purpose of the prevention of lead storage. Acidosis certainly causes the liberation of ionic lead, but calcium actually leads to its storage, and we are in the habit of exhibiting calcium lactate for this purpose in order to avoid toxic manifestations, and have injected calcium chloride intravenously to mitigate these. Dr. Todd also tries to persuade his readers that we believe that the action of the lead is local only; I have frequently said that it acts constitutionally as well as locally, and this is based on experimental work, all of which has been published. Indeed, the researches of Prof. Lewis and Dr. Corran just mentioned indicate that beneficial changes are produced by lead in deranged body functions associated with cancer. We have, too, presented evidence that the action of lead is also local. This was evidently clear to the reviewer of our book, "Some Aspects of the Cancer Problem," in the *British Medical Journal*,[5] for he writes:—

> "The exact way in which lead deleteriously affects the cancer cell is not dogmatically stated, but it is thought to be probably both local and constitutional."

There is another point in regard to the general clinical aspects, both in Dr. Todd's paper and in your leading article which requires notice. Stress is rightly laid on relief in the disease as well as on cure. With regard to alleviation, I have time and again pointed out that this must be taken into account in any assessment of the value of lead therapy. On page 421 in our book mentioned above, the following sentence contained in a paper published in 1929 will be seen:—

> "Again, it cannot be too forcefully reiterated that in the early application of any new method, however important an absolutely curative effect may be, *arrest and alleviation of the disease must equally be taken into account. . . .*" (The italics are in the original.)

Nevertheless, clinical cures, such as we have obtained, are the ideal at which to aim, for obviously if they can be obtained alleviation will be more sure in the rest of the cases. Dr. Todd has apparently obtained no clinical cures of the disease.

As to lead selenide, to which Dr. Todd has almost exclusively devoted his attention, we have made this and other preparations of lead and selenium, and have found that the selenide has little value in comparison with other preparations. Lead selenide has not much, if any, abortifacient action; it has a low chemotherapeutical value, and, in our opinion, cannot be relied upon to affect malignant growth, hence the limited success of Dr. Todd. It is, in fact, not a preparation that should be employed to-day, for there are many better; indeed, this has been so from the commencement of our work. I hope soon we shall be able to say something about the more recent organic preparations made by Prof. Heilbron and Dr. Beilonsohn, which have given us good experimental results, and have, apparently, a satisfactory chemotherapeutical index.

For the sake of many patients who, if they knew the truth, would more readily submit to treatment, I must make it quite clear that in our hands it is very rare for any reaction at all to be produced by intravenous injections of lead preparations, and certainly injurious effects never occur at the present time. We have not seen a serious reaction for some years. There is a general impression abroad, and this is fostered by opponents of our methods and, I have reason to believe, by Dr. Todd himself, that severe reactions inevitably follow treatment administered by us. This is not so. Our preparations are as atoxic as lead selenide, and are very active, not comparatively inert as is lead selenide. Dr. Todd mentions, and in your leading article reference is made to, smaller dosage. In this connexion I would quote from a paper I published in 1928, as published in "Some Aspects of the Cancer Problem": "We have tended gradually to decrease the individual doses while aiming steadfastly at the administration of a high total quantity of lead—that is, 0·5 g. to 0·8 g. or a little more. . . . From this we may provisionally conclude that it is advisable to continue in a modified form the treatment over a longer period of time than previously considered necessary."

I am sorry to have to write this letter, but in view of all that has happened in connexion with our work it is necessary to insist that at least the truth be told, the literature be studied, and the work efficiently conducted, otherwise lead therapy in malignant disease will suffer at the hands not only of critics but also of friends.

I am, Sir, yours faithfully,

Liverpool, August 30th, 1930. W. BLAIR BELL.

1. Todd, A. T.: Brit. Med. Jour., 1929, i., 130.
2. Bell, W. Blair: THE LANCET, 1922, ii., 1005.
3. Corran, R. F., and Lewis, W. C. M.: Biochem. Jour., 1928, xxii., 451.
4. Lewis, W. C. M.: Rep. Internat. Conf. Cancer, Lond., 1928, p. 437.
5. Review, Brit. Med. Jour., 1930, ii., 63.
6. Bell, W. Blair: Brit. Med. Jour., 1929, i., 431.

RADIUM AND LEAD SELENIDE COMBINED.

To the Editor of THE LANCET.

SIR,—Dr. A. T. Todd has recently stated in your columns (August 23rd, p. 389) that radium treatment of cancer after lead selenide treatment not only has no retarding influence on the tumour growth, but causes tumours which had been held in check by lead selenide to spread rapidly and shorten life. He mentions 12 cases, but gives no details of how the

radium was applied. From this he argues that radium treatment has no direct action on the tumour cells, not even a retarding influence on their growth; and that the adverse influence of radium treatment is entirely a secondary effect. In view of the importance of this, perhaps we may ask exactly what X ray or radium treatment did these 12 patients have, and was the dose adequate? Recently at the Radium Institute there have been two patients who had several months' treatment with lead selenide, during which tumour growth ceased, but in which the tumours had not disappeared; they were given radium treatment (as under) with excellent results.

1. Male, aged 52, squamous epithelioma of neck. Lead treatment Sept. 20th, 1929, to March 20th, 1930. Tumour measured then 6·6 × 7·0 cm. On March 20th, 19 gold seeds 0·5 mm. gold, 1·8 mc. each, were inserted into the tumour, which rapidly disappeared, and on July 2nd patient was still free of disease and in good health.

2. Male, aged 54, secondary glands both sides of neck. Squamous epithelioma. Lead selenide Oct. 29th, 1929, to Dec. 18th. Aluminium seeds inserted into both sides on Jan. 1st, 1930, and 28th, when the tumours measured 5·5 and 6·0 cm. in diameter. On Feb. 17th the tumour on the right side measured 3·5 cm. and the left 5 cm. On July 2nd the right had disappeared, and the left was still growing. On July 14th the latter was again seeded.

It appears, therefore, that radium treatment after lead selenide treatment is not always followed by disastrous results.

We are, Sir, yours faithfully,

PHILIP GOSSE,
J. C. MOTTRAM.

The Radium Institute, 16, Riding House-street, W.,
August 30th, 1930.

TREATMENT OF PULMONARY TUBERCULOSIS IN SWITZERLAND AND AT HOME.

To the Editor of THE LANCET.

SIR,—I cannot agree with some of your correspondents that Dr. Harrison has overstated the facts. He has apparently a very intimate knowledge of the conditions of a winter cure in Switzerland, and although his statements may not apply to all patients or to all cure stations in the Alps, he has, speaking generally, drawn a very suggestive picture of the life of the average tuberculous patient wintering there. But there is one point which has not been stressed by any of your correspondents. I refer to the apparent declimatisation produced by a prolonged stay in Switzerland. Patients on their return home are more likely to relapse than those treated in our home sanatoria. They are more liable to catarrhal affections of the lungs and, as everybody knows, these affections are too often the forerunner of a process of reactivation in the old focus. If the patient finds that Switzerland suits him well, and if he is in a position to go out there winter after winter or, better still, if he is able to stay out there altogether, well and good. But if it is a question of six months there and back again to work in our "climate of perpetual damp and mist," then it is as well for him to undergo the treatment in a British sanatorium.

Dr. Amrein has not helped his case by his reference to "our perpetual damp and cloudy atmosphere." There are many localities from Land's End to John o' Groats where there is on the yearly average less mist and fog than in some of the best known "cure" stations in Switzerland. I have lived in the Upper Speyside district of Inverness-shire for the last 11 years, and I can say without fear of contradiction that I have seen less fog and mist in those 11 years than I saw for two winters spent in one of the most noted and best advertised Swiss resorts.

When the case is one where a very high altitude is indicated, and where the patient has to work for his living, I know of no more suitable climate than Southern Rhodesia. Entry is not difficult, provided the patient is sufficiently fit and is not likely to become a burden on the colony. For the last ten years I have sent many patients to Rhodesia after a preliminary cure here; most of them have made their homes out there, and the letters I receive from them are very encouraging.

I am, Sir, yours faithfully,

Kingussie, August 26th, 1930. FELIX SAVY, M.D.

TONSILLOMYCOSIS.

To the Editor of THE LANCET.

SIR,—In the early part of last winter I came across a fungus in a culture from the throat of a young woman. I did not recognise the condition until I read Castellani's article on tonsillomycosis in the January number of the *Practitioner*. Since then I have met with one other case, referred by Dr. Martin Edwards as a diphtheria suspect. This was a young man living on a croft. The tonsils, soft palate, and uvula were all patchy with creamy membrane, which peeled off leaving a slightly ulcerated surface. Direct smears showed monilia, and on blood-agar I got an almost pure culture. The chief symptom was unusual soreness on swallowing. Painting with solution of silver nitrate cleared it up in a day or two.

I am, Sir, yours faithfully,

JAMES CAMPBELL, M.B., Ch.B.

Lerwick, Shetland, August 16th, 1930.

INTRABRONCHIAL DRAINAGE.

To the Editor of THE LANCET.

SIR,—As is so rightly pointed out in your leading article of August 9th (p. 303), the mechanical factors in the course and treatment of such cases as bronchiectasis are of the greatest importance. One feels they require perhaps more attention than is given to them often, especially in the matter of mechanically assisting the patient to clear his chest. The bronchial blockage, the tenacity of the secretion, and the comparatively inefficient expulsive power from the bases of the lungs must all be taken into consideration. The poor emptying power of the lungs is usually helped by getting the patient to cough whilst leaning over the back of a chair, for instance, and this certainly helps, but it is not enough when one considers the bronchial obstruction and the thick tenacious fluid. Bronchoscopic methods are the only efficient and direct aids to the removal of the purulent material.

Of bronchoscopic instruments Chevalier Jackson's are the most satisfactory for this work on account of their lightness, good lumen, and practical adaptation to the needs that may arise. Those with proximal illumination, however, such as Haslinger's, have the advantage of throwing a powerful light well ahead of the distal end of the tube, so giving a good illumination of the area to be approached. Bronchial blockage and the filling of the tubes with fluid are the main causes of the distressing coughing. This blockage may be due to granulations or stricture, and in many cases both these can be treated through the bronchoscope with considerable relief to the patient. As Jackson has pointed out, the fluid from the lungs is often of such a viscid nature that it cannot be poured out of a reversed test-tube. In fact, when one sees the fluid, one wonders how it is ever coughed

from the bases of the lungs. Aspiration through a bronchoscope at regular intervals is the only satisfactory method of removing this material, and helps the patient greatly.

Aspiration helps to avoid the overflowing and flooding of other parts of the lungs mentioned in your leading article. One can picture the fluid being mixed up by the act of coughing, some reaching the larynx and some falling back into or being driven into other parts of the lungs. Direct aspiration seems to be a much neater process. Lavage through the bronchoscope is not good treatment, but vapours may be introduced.

I am, Sir, yours faithfully,

C. HAMBLEN THOMAS, F.R.C.S.

Harley-street, W., August 25th, 1930.

CARBON DIOXIDE FOAM BATHS.

To the Editor of THE LANCET.

SIR,—It has been our privilege to discuss Foam Therapy with a number of Medical men interested in the Article by Dr. Shillito on Carbon Dioxide Foam Baths published in your issue of June 28th,

With reference, in this connexion, to the Equipment required, may we ask for space in your columns in which to qualify Dr. Shillito's statement when he says: . . . "All that is now required to carry out this treatment is a Foam Distributor obtained either in this Country, *or, more cheaply, Abroad*" . . . &c.

We wish to make it clear that this Company holds British Letters Patent which cover the preparation of a *Double Layer Bath* of Water and Physical Foam. Therefore, any person who produces in England a Double Layer Bath such as Dr. Shillito describes, or other means than a Sandor Distributor (of which we also own the entire British Patent Rights) for the purpose of giving treatment, is thereby infringing these Patent Rights.

It follows that any Doctor who buys Abroad an Appliance for the production of a Double Layer Foam Bath, and uses it for giving treatment in his professional capacity in this Country, is equally injuring our Patents.

And so you will see, that when Dr. Shillito informs our readers that they can buy suitable Apparatus Abroad, he is suggesting, unwittingly of course, a procedure which they would not wish to follow when in full possession of the facts.

For your information, we would refer you to British Letters Patent Nos. 305030 and 280208.

We are, Sir, yours faithfully,

for SOAPLESS FOAM LIMITED,

D. CORNFORTH,

Manager.

17–18, Dover-street, London, W. 1., August 22nd, 1930.

MIDDLESEX HOSPITAL.—The 1929 report refers to the lead given by opening beds specially for radiological treatment of cancer. The system of not waking patients before A.M. has been adopted by over 100 hospitals here and in distant lands. More than two-thirds of the reconstruction scheme had been completed at the end of last year, and a number of private rooms for paying patients have already been opened. Building operations reduced the number of beds available, and the in-patients numbered 5607, as compared with 6271 in 1928. This loss of beds increased the cost per head, which was £5 4*s.* 8*d.* against £4 15*s.* 1*d.* in the preceding year. Out-patients numbered 54,400, an increase approaching 2000. In the cancer wing 870 patients were treated, an increase of 158, which, as the number of beds is the same, is accounted for by shorter stays. The individual cost of these patients was £6 6*s.* 11*d.*

STILLBIRTHS AND INFANT MORTALITY.

INTERNATIONAL INQUIRY.

THE inquiry made during 1927–28 by the Health Organisation of the League of Nations[1] into the causes of stillbirths and infant mortality during the first year of life has not been merely into the statistics but into the medical, social, and hygienic aspects of the subject. Investigations were made in Austria, France, Germany, Great Britain, Italy, the Netherlands, and Norway, by methods as far as possible uniform; and since it was impossible that the investigators should attend all confinements in the selected districts, information was obtained through notification by competent authorities, and, in cases of death, by application to the doctor, the midwife, the family, the welfare centre, or any other institution which the mother had attended. The social inquiries were made through the visiting nurse, officials in the registrar's office, clergymen, or other persons well acquainted with the environment of the family, as well as by visits to the home. Information relative to the child's family, the child, and the confinement was obtained by means of a uniform inquiry form which took account of the housing conditions, the morbid history of the family during the life of the child, the obstetric history of the mother, the care and feeding of the infant, the history of the fatal illness, and any personal observations of the investigator.

The infant mortality of the various districts was classified under the headings: low, moderate, high, and very high, and the investigation was made over a period of a year in every case. The investigation in Italy was begun later than elsewhere, and is not included in this analysis.

District Mortality.

Districts with a low infant mortality.—In Great Britain, where the inquiry was conducted by Dame Janet Campbell, a low infant mortality was found in Oxfordshire, and within the same range—3·5 to 4·9 per cent.—fell Hedmark and Oslo West (Norway), and Leiden and Dordrecht (Netherlands). Oxfordshire and Hedmark are both agricultural districts where the housing conditions were found to be poor, the hygienic conditions on the whole favourable, and breast-feeding the usual rule. In Oxfordshire two-thirds of the women received antenatal supervision, but in Hedmark this was rare and child welfare organisation inadequate. Dordrecht, Leiden, and Oslo West, urban districts with a commercial population, shared favourable housing and hygienic conditions, numerous and well-patronised medical institutions and welfare clinics, and a preponderance of breast-fed infants.

A moderate infant mortality—5 to 6·9 per cent.—was found in Croydon and Staffordshire (Great Britain), Breda, Maestricht and Emmen (Netherlands), Lochois and Chinonais (France), Lippe (Germany), and Oslo East (Norway). Rural districts included Staffordshire, Lochois and Chinonais, Lippe, and Emmen, and conditions varied considerably between them; in Staffordshire, for example, the population is semi-agricultural and semi-mining, housing was found to be rather poor, child welfare work well organised, antenatal supervision sought by about one-half the pregnant women, and breast-feeding commoner than artificial. In Lochois and Chinonais, with a wine-growing and agricultural population, and

[1] Memorandum C. H. 820. Obtainable (3*s.* 6*d.*) from George Allen and Unwin, League of Nations Department, 38, Great Ormond Street, London, W.C. 1.

moderate or satisfactory housing and hygienic conditions, child welfare organisation was seen to be little developed and antenatal supervision rare; pregnant peasant women were frequently overworked, but confinements are always conducted by a doctor or trained midwife; breast and artificial feeding maintained equal proportions. In Lippe, also an agricultural district, housing and hygienic conditions are regarded as favourable on the whole, but social conditions often bad; half the female population work, and though antenatal supervision is rare, child welfare organisation is good and breast-feeding common. In Emmen the housing conditions are in places often very bad, and unemployment is prevalent; the birth-rate is high and breast-feeding common, while child welfare and antenatal clinics are only now in the process of organisation. Contrasted with these are the four urban districts with a moderate infant mortality, which show a certain uniformity of conditions. In all except Maestricht the housing conditions are fairly good, and antenatal and child welfare work well organised; breast-feeding was said to be common in all except Croydon.

Districts with a high infant mortality—7 to 9·9 per cent.—included Sunderland (Great Britain), Pays de Caux and Plaisance and the Zone of Fortifications (France), Cassel and Augsburg (Germany), Vienna, districts VI., VII., and VIII. (Austria), and Hoensbrock (Netherlands). Pays de Caux, mainly agricultural, showed bad housing conditions, poorly developed child welfare and antenatal organisations, unskilled midwifery, and defective feeding of infants; Hoensbrock, the other rural district in this group, is devoted chiefly to mining; the housing conditions are favourable, and infant welfare clinics exist but are little used. The remaining districts in this group, all of which are urban, have housing conditions which vary from poor to deplorable, except in Cassel, where they are moderately good, and offer child welfare and antenatal facilities of a high order in all; in the majority of these areas the pregnant women work, in some cases excessively.

A very high infant mortality (10 per cent. and over) was found in Pays de Bray (France), Stelitz (Germany), and Gmunden, Schärding and Engelhartszell, and Vienna, district X. (Austria). All of these, except the Vienna district, are agricultural, and mostly the population shows a low standard of intelligence. Work is common and often excessive among pregnant women, and the child welfare or antenatal centres are either limited or absent, and are seldom well attended; infant feeding is usually defective and frequently artificial; midwifery often reaches a poor standard, and illegitimacy is common. In Vienna, district X. the living and social conditions were found to be bad, and pregnant women often overworked; infant welfare work, however, is well organised.

Principal Causes of Death.

The principal causes of death among infants were classed under digestive disturbances, respiratory diseases, and stillbirth, either due to premature delivery, obstetrical trauma, or some other cause. By far the largest number of deaths were due to respiratory diseases, either as an individual condition or following one of the specific fevers which also played a considerable part in raising the infant mortality. Premature birth, and death from unknown causes were responsible for the highest figures in many districts, while digestive disturbances took a less prominent position in every case. It was found that, in areas where the infant mortality was high, specific infections reached a considerable figure as a ca[use], while in districts with a low mortality they w[ere] practically non-existent.

Conclusions and Recommendations.

The investigators conclude that in districts wh[ere] the mortality is low and child welfare clinics [are] abundant and well organised, the incidence of respi[ra]tory and infectious diseases and digestive disturban[ces] falls considerably, while the rates for stillbirths a[nd] infant mortality during the first weeks of life rem[ain] practically the same everywhere. The preventi[on] of stillbirth, they consider, depends largely [on] efficient antenatal care and the early diagnosis [of] malpresentations, toxæmias of pregnancy, syphi[lis], or other conditions which permit of prophylax[is]. They therefore recommend the establishment of m[ore] antenatal clinics, the supervision of the pregn[ant] woman in industry, and a campaign against t[he] employment of unskilled midwives. They also sugg[est] that financial and other forms of assistance to pregn[ant] women should be extended, so as to permit them [a] rest during the latter months of pregnancy, and th[at] social measures should be applied impartially [to] legitimate and illegitimate children. The need [for] more institutional provision and for the more thorou[gh] instruction of doctors and midwives in the care of t[he] infant are emphasised; as a preventive measu[re] against digestive disturbances and respiratory a[nd] other diseases the extension of child welfare clin[ics] and the better instruction of the public in possi[ble] modes of infection are advised.

MEDICAL NEWS

Medical Society of London.

The syllabus for the first half of the 158th session beg[ins] with a presidential address on the Stethoscope, Past a[nd] Present, by Dr. R. A. Young, to be given on Oct. 13, following the annual general meeting of the Society. the Monday evening discussions that on the prophylac[tic] and therapeutic values of vaccines will be introduc[ed] (Oct. 27th) by Sir Almroth Wright; on the diagnosis a[nd] treatment of malignant disease of the chest (Nov. 10th) Prof. Chevalier Jackson; on the pathological conditions the eye due to inflammatory changes in other parts of t[he] body (Dec. 8th) by Mr. A. F. MacCallan and Mr. Ern[est] Clarke. Nov. 24th will be a clinical evening. The Llo[yd] Roberts lecture on Painting and the Healing Art will delivered on Wednesday, Nov. 19th, by Prof. Willia[m] Rothenstein, M.A. The Lettsomian lectures next spri[ng] are to be given by Dr. J. W. McNee on the Spleen, Structures, Functions, and Disorders. The annual orati[on] of the Society will be delivered on May 11th, 1931, by [Sir] John Rose Bradford.

St. George's Hospital Medical School.

On Wednesday, Oct. 1st, at 3 P.M., Lord Riddell will gi[ve] an inaugural address at the annual prize distribution the Board Room of St. George's Hospital. Dr. Jam[es] Collier will take the chair at a dinner to be held on t[he] evening of the same day at the Hyde Park Hotel, Knigh[ts]bridge.

Society of Medical Officers of Health.

A provincial meeting of this society will be held at t[he] Grand Hotel, Lowestoft, at 4 P.M., on Friday, Sept. 19t[h]. The subject of discussion will be the Public Health Significan[ce] of General Medical Service Schemes, and the speakers w[ho] include: Dr. Astley Clarke, senior physician, Leicester Roy[al] Infirmary; Dr. C. E. S. Flemming, member of Consultati[ve] Council, Ministry of Health; Dr. H. P. Newsholme, M.O.[H.] for Birmingham; and Dr. A. M. N. Pringle, M.O.H. f[or] Ipswich. Members will later be entertained to dinner [by] the Mayor and Corporation of Lowestoft, and on t[he] following afternoon there will be a launch trip on Oult[on] Broad. Members who intend to be present are asked notify the executive secretary at 1, Upper Montagu[e] street, Russell-square, London, W.C. 1, by an early po[st]

Chelsea Clinical Society.

The annual dinner of this society will be held at the Rembrandt Hotel on Tuesday, Oct. 28th, at 7.30 P.M.

Paddington Medical Society.

The next meeting of this society will be held on Tuesday, Sept. 9th, at the Great Western Hotel, Paddington, at 8 P.M., when Dr. E. G. Graham Little, M.P., will give an address entitled Private or Contract Practice?

Royal Sanitary Institute.

The forty-second congress and health exhibition of this Institute will be held at Glasgow from July 4th to 11th, 1931, under the presidency of Sir Henry Mechan.

Radium at Bradford.

The Health Committee of Bradford Corporation has been given official permission to borrow £20,000 for the purchase of radium for St. Luke's Hospital.

King's College Hospital.

The in-patients last year numbered 7006 and cost £10 15*s.* 5*d.* per head; the 41,684 out-patients cost 12*s.* 9*d.* each. The number of patients received into the hospital was the highest since the war. The income was £100,677, and the expenditure £101,821; the debt amounted to £65,867. The annual report refers to the world-wide reputation obtained by the urological department founded in 1922, and to the enormous development of the physical treatment department. A clinic was founded for the investigation and treatment of asthma and allied diseases, and now has more than 100 cases for detailed study.

King's College Hospital Medical School.

This school has now completed a hundred years' work, and an account of this will be given by Dr. Raymond Crawfurd, on Oct. 1st, at the opening ceremony of the winter session, when Dr. G. F. Still will preside. The centenary dinner, at which Sir StClair Thomson will take the chair, will be held on the same evening at the Connaught Rooms. It is proposed to mark the centenary by completing the Medical School buildings as soon as the necessary funds can be collected.

Liverpool Open-Air Hospital for Children.

This hospital at Leasowe, in Cheshire, last year discharged 96·6 per cent. of tuberculous cases "disease quiescent." Of the 110 cases so discharged in 1926, 94 per cent. are now known to be fit; in 1927, 84·8 per cent.; in 1928, 90·6 per cent. An interesting section of the report deals with the 224 cases treated by artificial light. While the results, it is thought, do not prove that artificial light has any specific action upon cases of tuberculous disease, combined general and local irradiation assists and hastens recalcification during convalescence and the healing of sinuses, and shortens the stay in hospital of cases of tuberculous adenitis and peritonitis.

Florence Nightingale Fund.

The annual report states that during the year 78 probationer nurses were admitted from the preliminary training school to the Fund's school at St. Thomas's Hospital, and 51 nurses completed their term of service and were awarded certificates. Miss Lloyd Still, matron of St. Thomas's, and superintendent of the Nightingale Training School, received 1159 applications for the regulations and accepted 163 applicants. From the opening of the school in 1860 to the end of 1929 2434 names were placed on the register of the Nightingale Nurses to be added ultimately to the hospital staff. At the end of the year 37 of these nurses were holding positions as matrons. The income of the fund was £2192 and the expenditure £1988.

Hospital Libraries.

At its conference at Cambridge, from Sept. 22nd to 27th, the Library Association will consider, among other subjects, the provision of libraries for hospitals. Besides a paper on the history and practice of this work in Great Britain, there will be papers from Denmark and the United States. Miss Ostenfeld will read a paper on Collaboration between Public Libraries and Hospitals in Denmark, and will open a discussion on the possibility of applying similar methods in this country. A second paper on the Psychological Value to Patients of Hospital Libraries will be read by Miss Perrie Jones, hospital librarian at St. Paul's, Minnesota, U.S.A. Further particulars may be had from the secretary of the Library Association, 76, Bedford-square, London, W.C. 1.

At the recent Empire Conference of the British Red Cross Society a resolution was passed approving "The Principle of Reading as part of Curative Medicine," and desiring to see it established in all hospitals in due course.

St. Mary's Hospital Medical School.

The annual dinner of past and present students will be held at the Trocadero Restaurant at 7 P.M. on Friday, Oct. 3rd. Dr. Reginald Fuller will take the chair.

New Operating Theatre at Keswick.

Sir John Randles is presenting a new operating theatre, to cost some £4000, to Keswick Hospital. It is to bear the name of Lady Randles.

Oxford Mental Defectives.

Subject to certain consents, Wyfold Court, near Henley-on-Thames, from which Lord Wyfold takes his title, is to be purchased by the Oxford City Council as a home for mental defectives.

Royal Dental Hospital of London.

The prize distribution and conversazione of this hospital and school of dental surgery will be held at the hospital in Leicester-square at 8 P.M., on Thursday, Oct. 2nd. Sir John Rose Bradford, F.R.S., will preside.

A Hunt Hospital Bed.

Mr. H. R. Turner, who has given a bed to the Devonshire Hospital, Buxton, has named it "The High Peak Hunt Bed." Mr. Turner, who is one of the joint masters of the hunt, desires that the bed should be associated with the farmers of the country.

Rebuilding Corbett Hospital.

It is proposed practically to rebuild the Corbett Hospital at Amblecote, Stourbridge, at a cost of £150,000, of which one-third would be provision for maintenance. Between £17,000 and £18,000 has already been subscribed, and it is hoped that substantial assistance will be forthcoming from the John Corbett Trust Fund.

New Doncaster Infirmary.

When the Earl of Lonsdale opened the new Royal Infirmary at Doncaster, he received purses containing more than £4000. The building has cost £156,000, of which £103,000 has been raised; it is the first portion of a scheme for an institution of 300 beds.

Red Cross Clinic for Rheumatism.

The British Red Cross Society's clinic for the treatment of rheumatism (Peto-place, Regent's Park, London, N.W. 1) has been reopened after a month's closure for internal reconstruction. The accommodation has been nearly doubled to meet an unexpectedly large demand. In future, the clinic will be open from 8.30 A.M. to 9.30 P.M., and whereas men and women were formerly treated on alternate days, arrangements have now been made by which both sexes can come on the same day. Since the opening in March about 25,000 treatments have been given, and the attendances have steadily increased. Considerable use has been made of the clinic by private patients, and in July alone over a thousand treatments were given on the private floor. The system of booking appointments for all patients has worked well and will be continued. Five honorary visiting physicians, with 15 clinical assistants, are now at work at the clinic. The remainder of the staff consists of a medical registrar, the sister-in-charge, with sisters-in-charge on each floor to assist her, 15 masseuses, 10 masseurs, and a lady almoner and her assistants. In addition, six new consultants—a dental surgeon, a radiologist, an orthopædic surgeon, a throat specialist, a surgeon, and a gynæcologist—have been appointed. For patients belonging to approved societies a course of nine attendances costs 25*s.*, with subsequent courses if necessary at 20*s.* For private patients treatments cost half a guinea each, in addition to a consultation fee of £2 2*s.* 0*d.* to the consulting physician.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

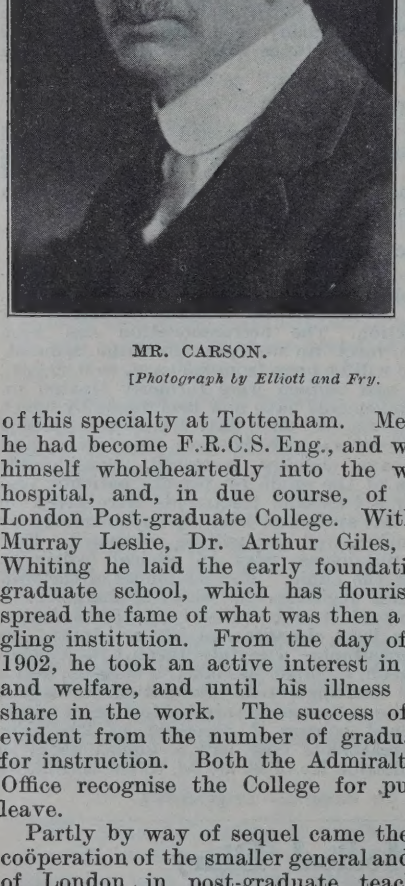
MONDAY, Sept. 8th, to SATURDAY, Sept. 13th.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal-Green, E. Special Course in Diseases of Children, occupying all day, with lectures and demonstrations. Syllabus and ticket of admission from the Fellowship of Medicine.

OBITUARY

HERBERT WILLIAM CARSON, F.R.C.S. Eng.

Mr. Carson's death at the age of 59 will be regretted not only by colleagues and collaborators, but by everyone who observed his devotion to post-graduate education and other desirable causes. He was a capable surgeon and a hard worker, and his services to the Prince of Wales's Hospital during the past 30 years were given by mind and heart without stint.

Born in 1870, Carson received his medical education at St. Bartholomew's Hospital, and qualified in 1895. His first appointment was that of house surgeon to the Tottenham Hospital (now the Prince of Wales's) and he returned there as assistant surgeon in 1897. At this time his bent was to towards ear, nose and throat surgery, and he served as clinical assistant at Golden-square, and in the throat department at St. Bartholomew's under Sir Anthony Bowlby before taking charge of this specialty at Tottenham. Meanwhile, in 1899, he had become F.R.C.S. Eng., and was able to throw himself wholeheartedly into the work of his new hospital, and, in due course, of the North East London Post-graduate College. With the late Dr. R. Murray Leslie, Dr. Arthur Giles, and Dr. A. J. Whiting he laid the early foundation of this post-graduate school, which has flourished and widely spread the fame of what was then a small and struggling institution. From the day of the opening, in 1902, he took an active interest in its development and welfare, and until his illness he had a large share in the work. The success of these efforts is evident from the number of graduates who attend for instruction. Both the Admiralty and the India Office recognise the College for purposes of study leave.



MR. CARSON.
[*Photograph by Elliott and Fry.*

Partly by way of sequel came the association and coöperation of the smaller general and special hospitals of London in post-graduate teaching under the Fellowship of Medicine. The grouping was based on a report and list prepared by the Tottenham group for the Athlone Committee, and during the greater part of the succeeding ten years Carson played an energetic part in the work of the Fellowship. This was arduous and often delicate. For many years he was unofficial honorary secretary for overseas, and in this capacity visited Canada in order to inform himself of the needs of medical men from the Dominions. Latterly he was chairman of the executive committee of the Fellowship, and kept thin moving by the impetus of his progressive personalit Recently he was appointed to the provisional organis tion committee of the new British Post-gradua Hospital and Medical School at Hammersmith.

As a surgeon, Carson's work was chiefly concern with the abdomen, but his interests remained genera He was the editor of—and a large contributor to "Modern Operative Surgery," published in 192 This appeared in two volumes and its design was exclude operations which have lost their usefulnes even if they are classics. In its preparation l secured the services of the younger generation surgeons and by enforcing the rule he produced valuable book within a reasonable compass. H also edited the tenth edition of Pye's "Surgic Handicraft." In the medical societies he was frequent speaker and displayed the same lucidity in his teaching. At various times he held th presidency both of the Hunterian Society and th Medical Society of London, and to these as to oth offices he brought enthusiasm and well-directe labour. In 1929 he travelled to America to delive the Mütter Lecture of the College of Physicians Philadelphia, taking Intestinal Obstruction as h subject, and treating it exhaustively from th historical, clinical, and operative points of viev During the late war, he held a captain's commissio in the Royal Army Medical Corps and served a surgeon to the King George Hospital.

Mr. Carson was married, but had no family. I leisure time he was a chess player, a keen crickete and a seafarer in small sailing boats. In person h was tall, well-built, soft of voice, and rather deliberat of utterance, and he had the gift of making friend Dr. A. J. Whiting as one of his colleagues a the Prince of Wales's tells us that it is not to much to say that Carson lived for the hospita "In all discussions of policy and procedure th crucial point with him was—what is best for th hospital? To those who know, or can read betwee the lines, it will be enough to say that he took a active part, or even a leading part, in two enlarge ments of the place, and was plunged in a third at th time of his death. Impetuous, genial, sometime rather ruthless, but with a well of tenderness not fa from the surface, he focused his attention on the objec of attainment rather than the foreground. But i he was forceful he was also lovable.

"He will be remembered not so much as good surgeon or a good hospital colleague, althoug he was both of these, or as an excellent teacher and he was that; but rather as a man of vivi personality and a stark worker. He manifeste to all, without any possibility of doubt, that th Prince of Wales's Hospital implied for him th Prince of Wales's motto."

CHARLES BUTTAR, M.D., D.P.H. Camb.

Dr. Buttar who died after an operation at Limecroft Guildford, on August 31st, was the son of Charle Buttar of Elgin Crescent, Notting Hill, by Emily daughter of James Lovett, of Cricklade, Wilts. He wa born in 1867 and was educated at Westminster Schoo and Pembroke College, Cambridge. In 1887 he gained a second class in the Classical Tripos and in 1889 he graduated, after obtaining a second class in

art I. of the Natural Science Tripos. He then roceeded to St. Bartholomew's Hospital and qualified 1892, taking the M.B. and B.Chir. Camb. the same year. In 1896 he proceeded to the .D., having been admitted M.A. in 1893 and king a D.P.H. in 1895. At St. Bartholomew's ospital he served as house surgeon for a year and as for a time assistant anæsthetist, after which he as appointed house surgeon to the Metropolitan ospital, subsequently becoming clinical assistant the Western Ophthalmic Hospital.

For many years Dr. Buttar carried on a large ractice in Notting Hill and Kensington, living tterly at Inverness-terrace until he retired to elstead in Essex. So long as he lived in London he ook an active part in the affairs of the British Medical ssociation and being a first-rate organiser and an cellent man of business, he acted during the war chairman of the Executive Committee of the Central edical War Committee, a body which was entrusted ith the delicate duty of deciding which members the medical profession could be spared for duty road; when the medical needs of the Army and avy were at their greatest there was a dangerous pletion of the medical men required to serve the untry at home. The Committee over which he esided, which was charged to hold the balance, had acuter or fairer member than its chairman. ie same qualities of tact and discretion were splayed at the Harveian Society, where he was in ccession secretary, vice-president, president in 1909, ustee and treasurer. He found the finances of the ciety in a bad state, but his energy and capacity abled him to hand over the treasurership to his ccessor Dr. G. de Bec Turtle in the flourishing ndition in which they have since been maintained. Dr. Buttar was also an active member of the Council Epsom College. He married in 1898 and had e son.

JOHN THOMSON WILSON, M.D., D.P.H. Aberd., J.P.

Dr. J. T. Wilson died on August 20th at his home Bothwell, Lanarkshire, at the age of 75. He d retired on grounds of health some years ago t maintained his interest in medical affairs.

A native of Cambuslang, in Lanarkshire, Wilson aduated in medicine at Aberdeen in 1891 and oceeded to the M.D. degree five years later, with a esis on the Natural History of Scarlet Fever. This as an elaborate and valuable statistical study and its neral conclusion that preventive measures have tle effect in limiting the disease has been, on the ole, verified. After serving as assistant medical icer in Shropshire for two years he was appointed unty medical officer for Lanarkshire in succession to e late Dr. James McLintock, who in 1894 became the st medical member of the Local Government Board Scotland. Lanarkshire is the biggest Scottish unty, with a population of about 300,000 rural and out 200,000 urban. Since Dr. Wilson's appointment asgow has annexed some of it, but the county ll remains the largest.

In the course of his long career as medical officer ilson commanded great influence because of his ssionate sincerity. He displayed a deep earnestness all that he undertook—which was a great deal. e organised his great department on lines to suit e developments of the future and the county is day reaping the benefit of his foresight. To any ident of the health movement in the Northern ngdom his elaborate annual reports were indispensable. Apart from these he produced two other striking pieces of work—namely, special reports on rivers pollution and on the housing of miners. The latter was one of five required by the Local Government Board as a preliminary to the work of the Royal Commission on Housing. All were excellent for their counties, but Wilson made his report both a groundwork for recommended reforms and an administrative survey of the whole mining area. It was of great use to the Royal Commission when members visited the numerous miners' rows and villages of Lanarkshire. The report showed what ought to have been done; the visit of inspection showed what had not been done. But the county has made up leeway and it would be difficult to name any place in Great Britain where, relatively, greater progress has been made. His devoted work over 30 years has ended in a body of institutions that any county may be proud of. Among them may be mentioned the Hairmyres Sanatorium and Work Colony established during his term of office.

Wilson was a scholar in the academic sense and he carried the detail of his work easily; but he felt very keenly the serious responsibility of the position. In addition he took his full share in the work of the Royal Sanitary Association of Scotland, the Society of Medical Officers of Health, and other bodies and held examinerships at Aberdeen and Edinburgh Universities.

Dr. Wilson's wife survives him.

Appointments

ADAM, JAMES R., M.B., Ch.B. Edin., D.P.H. Edin. and Glas., has been appointed Medical Officer of Health for the county of Roxburgh.

BROWNLIE, JAMES LAW, M.D., Ch.B. Glasg., D.P.H. Camb. (at present County Bacteriologist and Pathologist in Lanarkshire), has been appointed a Medical Officer of the Department of Health for Scotland.

DUGAN, ALEXANDER M., M.B., Ch.B. Aberd., D.P.H. Aberd., has been appointed Assistant Medical Officer of Health for School Medical Services in Aberdeen.

THOMAS, ALFRED TREVOR GWYN, M.B., B.S. Durh., has been appointed one of the Surgeons on the *Mauretania*.

Certifying Surgeons under the Factory and Workshop Acts: AITKEN, J. (Wainfleet District of the County of Lincoln); COXON, H. C. (Newburn District of the County of Northumberland); CREASER, F. G., M.B., B.Ch. Edin. (Snaith District of the County of York, W.R.); THOMSON, G. L., M.B., Ch.B. Glasg. (Tighnabruaich District of the County of Argyll).

Vacancies

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road.—M.O. At rate of £110.
All Saints' Hospital for Genito-Urinary Diseases, Vauxhall Bridge-road, S.W.—H.S. At rate of £150.
Ascot, Heatherwood Hospital.—Res. Asst. M.O. £300.
Barnsley, Beckett Hospital and Dispensary.—Jun. H.S. £140.
Bath, Royal United Hospital.—Asst. H.S. At rate of £120.
Bedford County Hospital.—H.S. £175. Also Asst. H.S. £130.
Birmingham General Hospital, Anæsthetist.—£120. Also three H.S.'s. £70.
Birmingham, Selly Oak Hospital.—Cas. O. £200.
Bradford City.—Asst. Bacteriologist. £600.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Bristol Royal Infirmary.—Asst. for Cancer Research Laboratories. £400.
Cambridge, Addenbrooke's Hospital.—H.S. Also H.S. to Special Depts. Each at rate of £130.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff, King Edward VII. Welsh National Memorial Association.—Area Asst. Tuberculosis Phys. £600. Also half-time Asst. Tuberculosis Officer for Pontypridd area. £300.
Cardiff Royal Infirmary.—Gynæcological H.S.—At rate of £50.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Asst. Anæsthetist.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100–£175.
Connaught Hospital, Orford-road, E.—H.P. At rate of £150.
Derby, Derbyshire Hospital for Sick Children.—Res. M.O. At rate of £150.

Dewsbury, New Dewsbury and District General Infirmary.—Jun. H.S. £150.
Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.
Dulwich Hospital, East Dulwich-grove, S.E.—Third Asst. M.O. £300.
Eastcote, Middlesex, St. Vincent's Orthopædic Hospital.—Res. M.O. At rate of £150.
East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. At rate of £200. H.P. At rate of £150. H.S. At rate of £120.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Glasgow University.—Dr. Robert Pollok Lectureship in Materia Medica and Therapeutics.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Second H.S. At rate of £120.
Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. £150 and £140 respectively.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Guy's Hospital Dental School, London Bridge, S.E.—Teacher of Conservative Dental Surgery. £1000.
Halifax Royal Infirmary.—3rd. H.S. £150.
Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—Two H.P.'s. Each at rate of £150.
Ilford, King George Hospital.—Res. M.O. £250. Also House Officer. £100.
Infants Hospital, Vincent-square, Westminster.—Two H.P.'s. Each at rate of £75.
Inverness District Mental Hospital.—Jun. Asst. M.O. £350.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150. Also H.S. At rate of £120.
Kingston-upon-Hull, City and County of, Beverley-road Institution.—Asst. M.O. £300.
Lanark, County of.—Bacteriologist and Pathologist. £750.
Lancashire County Council.—Asst. County M.O. £800.
Lancaster County Mental Hospital.—Asst. M.O. £350.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Liverpool and District Hospital for Diseases of Heart.—H.P. At rate of £52.
Liverpool Royal Children's Hospital.—Second Res. M.O. At rate of £120.
Liverpool Stanley Hospital.—H.P. and H.S. Each £100.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.
London Hospital, E.—Surgical First Asst. and Registrar. Also Medical First Asst. and Registrar. Each £300.
London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200. Also Two Surg. Regs. Each £100.
Macclesfield General Infirmary.—Res. H.S. At rate of £180.
Madras, Medical College, Vizagapatam.—Professor of Pathology. 1100 Rs. per month.
Manchester, Ancoats Hospital.—H.S. At rate of £100.
Manchester and Salford Hospital for Skin Diseases.—H.S. £100.
Manchester, Baguley Sanatorium.—Asst. M.O. £350.
Manchester, Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s. At rate of £150.
Manchester, Royal Children's Hospital, Pendlebury.—Res. M.O. and Res. Surg. O. At rate of £125.
Manchester Royal Infirmary, Roby-street.—Jun. H.S. and Cas. O. £100.
Merthyr General Hospital.—Res. H.S. At rate of £150.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. At rate of £150. Also H.P. and H.S. Each at rate of £125.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
Northampton General Hospital.—H.P., 2 H.S.'s, and 2 Asst. H.S.'s.—All at rate of £150.
Nottingham Children's Hospital.—Res. H.S. At rate of £150.
Nottingham General Hospital.—H.P. Also 2nd Cas. O. Each at rate of £150.
Oldham Royal Infirmary.—Two H.S.'s. Each at rate of £175.
Park (Fever) Hospital, Hither Green, S.E.—2 Asst. M.O.'s. Each £500.
Plymouth, South Devon and East Cornwall Hospital.—Asst. Pathologist. £350.
Preston and County of Lancaster Royal Infirmary.—H.S. At rate of £150.
Princess Louise Kensington Hospital for Children, St. Quintin-avenue, N. Kensington, W.—H.S. and Cas. O. At rate of £75. Also Hon. Physician and Hon. Radiologist.
Reading, Royal Berkshire Hospital.—Cas. O. and Res. Anæsthetist. Each at rate of £150.
Royal Dental Hospital of London, Leicester-square, W.C.—Asst. Dental Surgeon.
Royal Eye Hospital, St. George's Circus, S.E.—12 Salaried Refractionists, 12 Clinical Assts., and 1 Pathologist.
Royal National Orthopædic Hospital.—H.S. At rate of £150.
Royal Northern Hospital, Holloway, N.—H.P., Res. Out-Patient Cas. O. and Anæsthetist. Each at rate of £70.
Ryde, Royal Isle of Wight County Hospital.—Vacancy on Hon. Med. Staff. Also Res. H.S. £180.
St. Bartholomew's Hospital, E.C.—Asst. Surgeon for Diseases of Throat and Nose. Also Asst. Surgeon to Orthopædic Dept.
St. Helen's Hospital.—H.S. £250.
St. Mary Abbots Hospital, Marloes-road, Kensington, W.—Asst. M.O. £250.
St. Mary's Hospital, W.—Physician in charge of Out-Patients.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.
Salford Royal Hospital.—Two H.S.'s Each at rate of £125.
Sheffield Royal Hospital.—Res. H.S. Also Res. Anæsthetist. Each at rate of £80.
Shrewsbury, Eye, Ear and Throat Hospital.—H.S. £200.
Southampton Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £100.
Southampton, Royal South Hants and Southampton Hospital.—Asst. H.S. At rate of £180.
South London Hospital for Women, South Side, Clapham, S.W.—H.P. and H.S. Each at rate of £50.
South Shields, Ingham Infirmary.—Jun. H.S. £150.
Stafford, Staffordshire General Infirmary.—H.S. and H.P. At rate of £200 and £150 respectively.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Ass H.P. At rate of £125.
Swansea Hospital.—H.S. £150.
Talgarth, Breconshire, Mid-Wales Counties Mental Hospital.—Asst. M.O. £350.
Tilbury Hospital, Essex.—H.S. At rate of £150.
Tynemouth, County Borough of.—Asst. M.O.H. £540.
Uxbridge, Middlesex, Hillingdon Institution.—Res. M.O. £600
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H. At rate of £100.
Walsall General Hospital.—H.S. At rate of £150.
West London Hospital, Hammersmith-road, W.—H.P., Tw H.S.'s., and Res. Anæsthetist. Each at rate of £100.
West Lothian, Bangour Mental Hospital. — Second Ass M.O. £350.
Westminster Hospital Annexe, 66, Fitzjohn's-avenue, Hampstea —Jun. H.S. At rate of £104.
Willesden Municipal Hospital.—Res. M.O. £250.
Wolverhampton and Midland Counties Eye Infirmary.—H.S. £15
Woolwich and District War Memorial Hospital, Shooters Hi S.E.—H.S. At rate of £100.

The Chief Inspector of Factories announces a vacancy for Certifying Factory Surgeon at St. Margaret's Hope (Orkney

Births, Marriages, and Deaths

BIRTHS.

AVERY.—On Aug. 25th, the wife of Dr. Harris Avery, of daughter.

CANE.—On August 23rd, at Reepham, Norfolk, the wife Dr. Maurice H. Cane, of a daughter.

KERRIGAN.—On Aug. 23rd, at Horrabridge, the wife of Surgeo Commander O. J. M. Kerrigan, R.N., of a son.

LLOYD.—On August 18th, at Avenue-road, Regent's Park, t wife of Eric Ivan Lloyd, F.R.C.S., of a daughter.

SPEIRS.—On Aug. 26th, at Walker-street, Edinburgh, the wi of Dr. R. C. Speirs, Tanganyika Medical Service, of daughter.

WHAMOND.—On August 19th, at Bentinck-street, W, the w of Captain W. D. Whamond, West African Medical Servi (Royal Army Medical Corps, retired), of a son.

MARRIAGES.

STEWART—DOS SANTOS.—On August 12th, at Knockbre Parish Church, Belfast, H. Hilton Stewart, M.D., M.R.C. Lond., to Clara Maria Luiza, daughter of the late M Antonio Luiz dos Santos and Mrs. dos Santos, of Rio Janeiro, Brazil.

WRIGHT—SHELDON.—On August 30th, at St. Andrew's Churc Cheltenham, Lieut.-Colonel Robert E. Wright, C.I.I I.M.S., M.D. Dub., to Ruby E. Sheldon, daughter of I S. T. Pruen, Cheltenham.

DEATHS.

AYTOUN.—On Aug. 28th, at Zermatt, Switzerland, while holiday, James Aytoun, B.Sc. (Hons.), L.R.C.P., M.R.C. only son of Dr. and Mrs. Aytoun, Broadstairs, Ke aged 23.

BALL.—On August 23rd, at Park-terrace, Oxford, John Augus Ball, M.B. Lond., in his 88th year.

BEVERLEY.—On August 31st, at Overstrand, Norfolk, Mich Beverley, M.D. Edin., M.R.C.S. Eng., L.S.A., J.P., in 89th year.

BUTTAR.—On Aug. 31st, following an operation, Charles Butt M.D., of Guildford, and formerly of Inverness-terrace,

CARSON.—On August 31st, Herbert W. Carson, F.R.C.S. En of Harley-street, Senior Surgeon, Prince of Wales's Gene Hospital, Tottenham, in his 60th year.

DOWN.—On Aug. 26th, at Whitchurch, Devon, Elgar Dow M.D. Durh., F.R.C.S. Edin., late of Plymouth, aged 63.

FINIGAN.—On Aug. 29th, Daniel O'Connell Finigan, M. Berlin, M.R.C.P. Lond., M.R.C.S. Eng., of West Sout bourne, formerly of Fordingbridge, aged 55.

HIGGINS.—On August 22nd, at the Shaftesbury Hotel, Liv pool, William Robert Higgins, M.D., F.R.C.S., of Brid street House, Louth, Lincolnshire.

KENT.—On August 18th, at a nursing home, Sydney Ke M.B., B.Chir. Camb., of The Corner House, Bexhill-o Sea, aged 65.

LITTLEJOHN.—On Aug. 27th, at Southwold, from heart fail while bathing, Thomas Plested Littlejohn, M.R.C. L.R.C.P. Lond., of Leigh-on-Sea, Essex.

MARTIN.—On Aug. 27th, at Atherton, near Manchester, Ma William Young Martin, M.B., Ch.B. Vict., late R.A.M (T.), aged 50.

SEYMOUR.—On August 18th, at his residence, Ambrose-aven Golders Green, George Seymour, L.D.S. Eng., of West E lane, N.W., aged 68.

TUKE.—On August 20th, at The Limes, Sutton Valence, Ma stone, George Montague Tuke, M.R.C.S., J.P.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices Births, Marriages and Deaths.

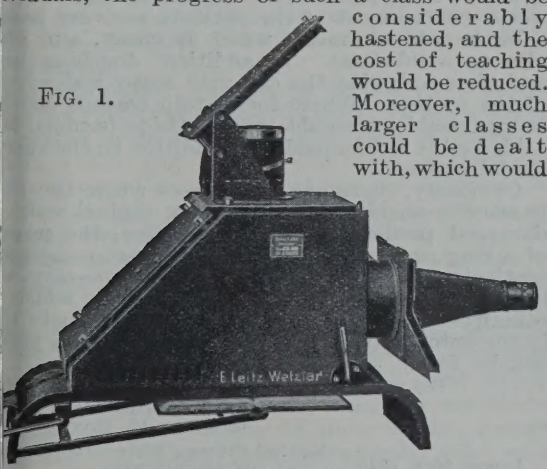
NOTES, COMMENTS, AND ABSTRACTS

AN APPARATUS FOR TEACHING LIP-READING TO LARGE AUDIENCES.

By CHARLES M. R. BALBI, A.M.I.E.E.,
ION. CONSULTING ELECTRICAL ADVISER TO THE NATIONAL INSTITUTE FOR THE DEAF.

)F the various available means of thought trans-ence for the stone deaf lip-reading is by far the st valuable, but it is essential that the "listener" ps a minute observation of the speaker's lips, ich at any distance is difficult. The conventions the deaf and dumb alphabet are still the most able means of intercommunication for the deaf, this system is useless when a deaf person wishes ommunicate with a person who has no knowledge the deaf and dumb code. Further, the language igns stamps the user as deaf, and the self-conscious son does not always care to give himself away by attempt at this sort of conversation. The next t method is perhaps writing, but the exchange vritten messages is cumbersome, and involves time. hird method of hearing through the sense organs ouch and vibration, vibrations being transmitted ough special "filter circuits" to a special receiver, been evolved by Mr. Robert H. Gault.[1] This hod does not seem to have been able to compete h the natural one of lip-reading, and hence it is irable to encourage this art where possible. ip-reading is usually taught individually, or if s taught in a class, each learner has the individual ntion of the teacher for a few moments. This advisable because, as already stated, it is ntial for the pupil to watch the speaker closely. it were possible to avoid this concentration on ividuals, the progress of such a class would be considerably hastened, and the cost of teaching would be reduced. Moreover, much larger classes could be dealt with, which would

FIG. 1.

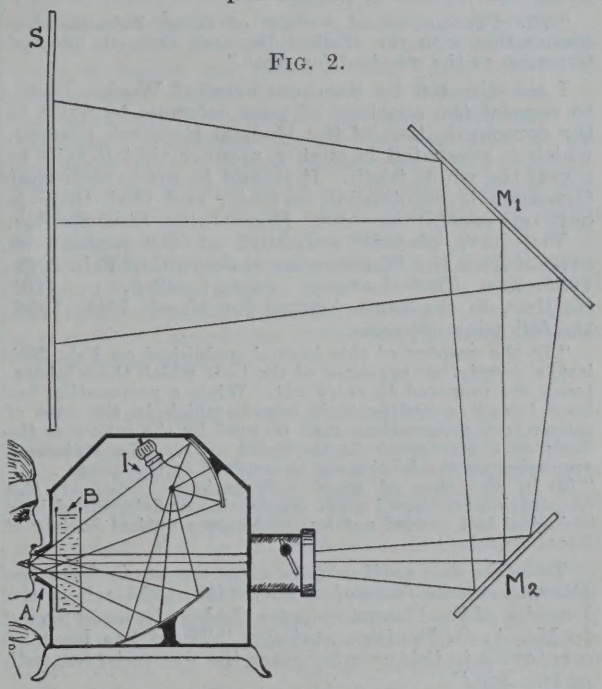


Apparatus for teaching lip-reading.

of great benefit to the deaf, since there is a great rtage of teachers of lip-reading.

The apparatus by which I have found it possible ulfil these requirements is very simple; it consists ely of a conveniently constructed epidiascope, ich has hitherto been used for reflecting illustra-is of books and specimens. With an apparatus dly lent to me by Messrs. Leitz and Co., ple proof was afforded that a teacher will be able instruct a large class; the movement of the cher's lips is reflected on to a screen and its area nlarged many hundredfold, and is easily followed n a distance. The apparatus on which my eriments were conducted (see Fig. 1) was not igned for reflecting parts of the living body; face of the speaker being so near the source of t is subjected to an intense light and heat, the ct of the heat being particularly disagreeable. With a larger (and hence more expensive) lens, the speaking distance from the source of light can be lengthened. This permits an alum bath to be inserted to absorb the radiant heat; the conducted heat is also much reduced at the greater distance, and the discomfort of the speaker would be abolished.

FIG. 2.



An optical system designed for enabling a large number of persons to lip-read from one source. A = aperture. B = alum bath. I = illuminating source. M_1 and M_2 = mirrors. S = screen.

Fig. 2 represents an optical system in which the disadvantages have been overcome. Study of the reflected image shows that the speaker's face will appear in vertical position, enlarged, but with the left side of the face transposed to the right and vice versa; but since the face is symmetrical, or sufficiently so for the purpose, the transposition does not affect those who are learning to read the movements thrown on to the screen. The mirrors (M_1 and M_2) can be placed at the back of the apparatus, and the screen (S) can be made of ground glass or some transparent material. The teacher speaks into the aperture A in the ordinary way, and the movements of his lips, which are reflected on the screen, are protected from the rays of the illuminating source I by the alum bath B. If it were decided to manufacture such an apparatus it should be possible to market it for about £100. In view of the saving in the teacher's time the question should be well worth considering. The apparatus could be used not only in schools but also in churches and lecture halls when the audiences are deaf.

[1] See Franklin: Inst. Jour., September, 1927, p. 329.

BLENORETTES.

WE have received from Medical Accessories, Ltd., 92, Baker-street, London, W., a simple device which is intended to take the place of the unsatisfactory gonorrhœa bag. Blenorettes are cone-shaped water-proof reservoirs for fitting over the glans and are retained in place by zinc oxide plaster strips. Beyond a perforated felt-like disc the cones are filled with antiseptic gauze. Among the advantages claimed for this appliance are ease of application, firm fixture, and non-obstruction of the flow of discharge. The tips of the plaster strips are non-adhesive so as to facilitate removal.

"AN OFFICIAL CORRECTION FROM THE M.R.C."

To the Editor of THE LANCET.

SIR,—In your issue of August 16th (p. 361) you give prominence to an official statement by the Medical Research Council under the above title. The Council complain that misuse has been made of their name in a statement issued by our American house which reads as follows :—

"The Pharmaceutical Society of Great Britain, after consultation with the Medical Research Council, adopted Gynergen as the standard for ergot."

I am directed by Sandoz Chemical Works, Basle, to request the courtesy of your columns to reply to the communication of the Medical Research Council, which is presented in such a manner that it fails to reveal the whole truth. It should be made clear that Gynergen is ergotamine tartrate, and that there is only one ergotamine—viz., Ergotamine, Stoll-Sandoz.

You have already published at my request an extract from the *Pharmaceutical Journal* of Feb. 20th, 1926 (see THE LANCET, August 23rd, p. 410). Further, in the same journal for March 13th, 1926, the following appeared :—

"In the number of this journal, published on Feb. 20th last, a description appeared of the tests which these laboratories are prepared to carry out. When a preparation has been tested, a certificate is issued, which in the case of satisfactory preparations may be used by the maker as the basis of a statement on the label. . . . The statement appearing on the label must be confined to the words . . ." "(6) In the case of ergot perparations, c.c. of this preparation contains 1 mgm. ergotamine as determined by a biological test carried out by the Pharmaceutical Society of Great Britain."

To make the matter more clear we quote from the *Pharmaceutical Journal* of May 14th, 1927, where the Director of the Pharmacological Laboratories, replying to Mr. A. O. Bentley, stated : "There has been no ergotoxine in this country since the war until a month or two ago."

The reasons which caused the substitution of a salt of an amorphous alkaloid, difficult to purify, of lesser stability, less soluble, and which can only be conserved with difficulty (in vacuo over phosphorus pentoxide) for a definite, pure, stable, crystalline substance (base as well as salt) are probably not relevant here, but it is clear that ergotamine tartrate *was* adopted as a standard for ergot preparations, and that the Medical Research Council *was* consulted.

I am, Sir, yours faithfully,

"Sandoz" Scientific and Research Department, August 25th, 1930. J. FLINT, Manager.

THE LANCET has been asked by the Director of the Pharmacological Laboratories, Pharmaceutical Society of Great Britain, to publish the following note : "With reference to the extract from the *Pharmaceutical Journal* of Feb. 20th, 1926, published by you, at the request of the Sandoz Chemical Works, in THE LANCET for August 23rd, it should be realised that the statement was superseded by the announcement in the paper by Burn and Ellis, published in the *Pharmaceutical Journal*, 1927, vol. cxviii., p. 384, that 'Ergotoxine phosphate has been adopted as a standard for ergot.' A copy of this paper was forwarded to the Manager of the Pharmaceutical Department, Sandoz Chemical Works, 5, Wigmore-street, on June 8th, 1927, and I have his acknowledgement of its receipt."

HAY-FEVER.

A BOOK by Dr. R. M. Balyeat,[1] now in its third edition, tells the familiar story of protein sensitisation, and tells it avowedly to the patient rather than to the profession. It gives the life history, with illustrations, of such substances incidental to the asthma story as kapok and orris ; it gives illustrations too, of a horse, a cat, some dogs, and so on—even a young woman looking into a looking g to illustrate the use of orris. In short, the layr will find the book light reading, and need not deterred by fear of finding it too scientific or techni Some of the explanations of technicalities probably seem naive, even to readers little ver in technical nomenclature. For example : "' terms 'cutaneous' and 'dermal' will frequently used. They refer to the skin." It would be he handed to criticise the book too strictly from the a of the pathologist, but it seems a pity to use term "hay-fever" for any paroxysmal rhinorrh whether caused by grass pollen or not.

[1] Allergic Diseases ; Their Diagnosis and Treatment. By Ray M. Balyeat, M.D., of Oklahoma City. Philadelphia : F. A. Davis Co. 1930. Pp. 395. $5.

THE DUTCH PESSARY.

To the Editor of THE LANCET.

SIR,—The recent correspondence on the Dutch raises the important point of uniformity of stanc in fitting. Where the Dutch pessary is used, i suitable case, the Walworth technique is based the view that the maximum occlusion of the va is the object of its use, provided there is no harm or uncomfortable pressure. The size of the ca determined by the capacity of the vagina in quest The average size of the cap used at Walworth (wl most of the cases are mothers with several child is 72½.

The rim of the cap rests behind the pubic bon the anterior fornix, and posteriorly, its exact posi is largely determined by the length of the cervi short, high cervix permitting the rim to be tuc away into the posterior fornix.

The essential points in the use of this pessary (*a*) that the rim should be in contact with the va walls throughout its circumference ; (*b*) that it sh not be dislodged by moderate increase of in abdominal pressure, such as coughing and straini (*c*) that it should be perfectly comfortable to wearer. The spermaticide commonly used at V worth (where most of the patients are very poo a lactic acid ointment, which is cheap, and se also as a lubricant. In addition, douching be and after removing the cap with soapy water is of the routine. Where for certain reasons douc is inadvisable, a soluble spermaticide (semori, l acid, &c.) is recommended in addition to the sper ticidal ointment.

Obviously, there are many cases where the D pessary is unsuitable, such as lax vaginal walls damaged perineum, prolapsed uterus, the pres of a ring or Hodge pessary, and severe constipa (patients are warned not to use the pessary w they are constipated). In some cases which otherwise quite suitable, there is no adequate s in the anterior fornix in which the rim of the pes can be fixed.

We are, Sir, yours faithfully,

LILY C. BUTLER,
GLADYS M. COX,
Medical Officers, Walworth Wome
August 30th, 1930. Welfare Centre.

LONDON CHARITIES.

WE have received a copy of the thirty-eig edition of the Annual Charities Register and Dig which, as everyone knows, is a classified registe charities in or available for the metropolis. L alteration has been made in this edition excep bring the subject matter scrupulously up to d and the index is a model of completeness and venience. As on previous occasions the attempt been made to include only bona fide institutions societies, but the preface contains the usual war that the entry of an institution in the registe in its advertising pages is not equivalent to a ge recommendation of it. The editor solicits partic of institutions which are not mentioned in the pre issue ; these should be sent to him at Denison H Vauxhall Bridge-road, London, S.W.

[1] London : Longmans, Green and Co., and Charity Orga tion Society. 1930. Pp. 553. 8*s.* 6*d.*

ADDRESSES AND ORIGINAL ARTICLES

HERMAL ADJUSTMENT OF MAN AND NIMALS TO EXTERNAL CONDITIONS.*

By Sir Charles J. Martin, C.M.G., M.B., D.Sc., F.R.C.P. Lond., F.R.S.,

ECTOR OF THE LISTER INSTITUTE OF PREVENTIVE MEDICINE; PROFESSOR OF EXPERIMENTAL PATHOLOGY IN THE UNIVERSITY OF LONDON.

LECTURE I.

N these lectures I shall deal more particularly with conditions pertaining to warm climates. No empt will be made to give an equitable review of present knowledge of thermal adjustment or to alogue the immense number of researches which ve accumulated during recent years. After a liminary survey of the mechanisms of thermotaxis hall deal more particularly with some fragments of subject which have particularly interested me for wards of 30 years, and to the understanding of which ne small contributions have been made by my oratory comrades and myself.

Homœothermism signifies a measure of superiority environment, and the development of this faculty played an important part in the history of animal . When animals emerged from the sea they became victims of great and comparatively sudden changes temperature, for the rate of physiological proses, like that of the chemical processes underlying m, is influenced by temperature and to someat the same degree. Accordingly, unless an mal can control its temperature all its activities st rise or fall with the temperature of its vironment.

The information available on the effect of temperae upon various physiological activities was analysed Snyder (1908). It has also been collected by nitz (1915 and 1925). The rate of muscular traction and the velocity of nervous impulses, the rt-beat, and many other bodily functions are reased two or three times for a 10° C. rise. The uence of the temperature upon combustion in tissues of both cold-blooded and warm-blooded mals has been extensively studied, for oxygen sumption integrates the whole cellular activities the animal and is convenient to measure. fortunately, comparatively few of these experints have been made under standard conditions. ongst the most regular of these results, because urbing conditions (e.g., movements) were minied, are those by Krogh (1916). Krogh's observans cover a range of 8–28° C. with cold-blooded atures and 14–28° C. with the dog. He found in cases about 10 per cent. rise per degree Centigrade. s, at compound interest, amounts to 2·5 times for and 18 times the rate for 30° difference, a by no ans unusual variation in atmospheric temperature. gh found, however, that the increase is not so formly progressive as the logarithmic law for mical action implies, the rate of increase being ater at the lower temperatures. By establishing emperature around 40° which, from the materials which animals are constructed, provides the ximum activity attainable, the homœothermic mal achieved an immense advantage over its poikilothermic contemporaries. Whenever the surrounding temperature fell it could escape its cold-blooded enemies and catch its cold-blooded prey. This advantage is bought at the expense of fuel. The cost of bare existence of a lizard at 15°–20° is only about 2½ per cent. of that of a man reckoned for the same surface. Martin (1902.)

The economy of reptiles is indeed amazing. I was once called in consultation to see a python whose state of health was causing some uneasiness to its proprietors. It had not eaten for three years. As far as I could ascertain the only symptom was anorexia. I ordered forcible feeding and it was suggested that I should assist with the treatment. The creature proved to be so vigorous that we were unable to accomplish our object until we had cooled the animal with ice to 5° C., when we gave it 20 lb. of beef steak by means of a long pair of metallurgical tongs. Next day, when it warmed up, it defeated our efforts by regurgitating the meat. On inquiry a year later I heard that it had recently died of some intercurrent infection.

Mechanism of Homœothermism.

To keep a system at constant temperature throughout, any change of heat loss must be balanced by a corresponding change in heat production or vice versa. This necessitates a sensitive self-acting mechanism set to a particular temperature and capable of controlling either the rate of heat production or heat loss, or both. A regulator on the principle used in a thermostat, which turns on more heat if the temperature falls and turns it off if the temperature rises, would be the simplest mechanism and, if sufficiently sensitive, would work as long as the temperature of the body was considerably above its environment. But, as the environmental temperature approached that of the body, this mechanism would be inadequate to maintain a homœothermic state, for in an animal heat production cannot be reduced below a minimum consistent with life, and this minimum is multiplied five to ten times with strenuous work.

On the other hand, a regulating mechanism operating upon rate of loss alone would be very costly in fuel and thereby limit the range of external temperature within which a constant internal temperature could be maintained, and we find that higher mammals have achieved a compromise; they use both methods of regulation and different sorts employ them to varying degrees. Man, in his nakedness and the wide area over which he can sweat, is the best adapted of all creatures to withstand high external temperatures and, coincident with his loss of hair, his increasing intelligence has allowed him to extend the downward range of external temperature at which he could remain homœothermic by providing himself with adjustable insulation.

THE DIFFERENT MEANS OF HEAT LOSS AND THE PROPORTION DISPERSED BY EACH UNDER DIFFERENT CIRCUMSTANCES.

Heat is produced by combustion in the cells of the body. It is lost by radiation, convection, and evaporation. Apart from voluntary modification of his surface by posture and of his insulation, heat loss in man depends upon the temperature of his skin and the rate at which water is evaporated from

*The Croonian Lectures delivered before the Royal College of sicians of London on June 12th, 17th, and 19th.

it. These in any given atmospheric conditions are determined by the volume of blood circulating through the skin in unit time and by the activity of his sweat glands. Animals also voluntarily control loss of heat by posture and involuntarily by varying the thickness of their fur through erecting the constituent hairs, but in man "goose flesh" is an almost functionless vestige of this useful protective reaction. The proportion of heat lost by radiation, convection, and evaporation is determined by the temperature of the surroundings, the moisture in the air, and wind. It was estimated by Rubner (1896) that a man comfortably clothed and sedentary in a room at 15° C., the air of which is 50 per cent. saturated with moisture, loses 44 per cent. of his total heat dissipation by radiation, 31 per cent. by convection, and 20 per cent. by evaporation from lungs and skin. Aldrich (1928), by more modern methods, arrives at much the same conclusions. The proportion is very different if the surrounding temperature approaches or exceeds the temperature of the skin and if the sun shines upon him. Under these conditions loss by radiation and convection are minimised or heat transference by them reversed. Only evaporation is available.

A man even at rest produces about 1·2 large calories per minute, so he must, under these atmospheric conditions, evaporate at least 2 c.cm. of water per minute (each gramme of water evaporated absorbs 585 small calories) or 120 c.cm. per hour, even under the most advantageous circumstances for deriving all the heat required for evaporation from the body. With fairly strenuous work the heat produced will rise to five or six large calories, requiring a minimum of 600 c.cm. (approximately a pint) to be evaporated per hour, or his body temperature must rise. If he has to work in the sun and surrounded by objects hotter than his body, he will require to evaporate considerbly more, possibly twice as much. Hunt (1913) states that when doing survey work in India, with a shade temperature varying between 100° and 110° F., and walking about three miles per hour in the sun the minimum consumption of water per day was 3 gallons (30 lb.). I found great difficulty in impressing this simple arithmetical calculation upon military authorities during some of our desert campaigning in the summer of 1916.

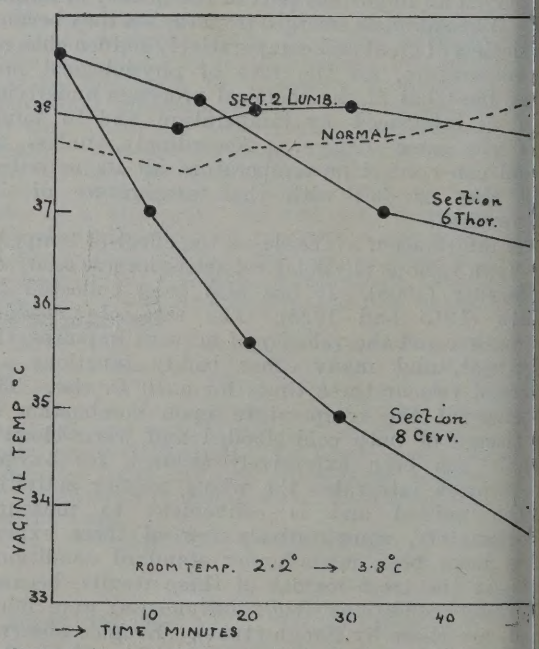
Nervous Mechanism of Thermotaxis.

This consists of afferent neurons with special terminations in the skin which are sensitive to temperature, efferent neurons activating various mechanisms whereby heat loss or heat production is varied and a central coördinating machinery. The afferent nerves subserving temperature sensations enter the cord by the posterior roots and, after crossing, ascend in the antero-lateral columns. They have been traced to the posterior part of the optic thalami. The efferent nerves concerned in modifying heat loss are the nerves to the vessels of the skin, to the sweat glands, and to the erector muscles of the hairs. The outflow of nerve-fibres from the cord to the sweat glands and *arrectores pilorum* closely follows the sympathetic distribution of the vasomotor nerves to the skin. The nerve paths along which impulses pass which modify heat production are extensive, and include the nerve-supply to the musculature and all the active tissues of the body, including the endocrine glands.

That heat production in muscles is under nervous control otherwise than through the motor nerves is held by Mansfield and Lukàcs (1915), because they found that in curarised animals section of motor nerves caused a fall in oxygen consumption. Fr and Jansson (1923) also concluded, from experiments on animals in which the motor n were cut and the oxygen consumption of the mu of the leg was measured on both sides and on one the arteries were stripped of nerve-fibrils, sympathetic fibres control heat production voluntary muscle. Newton (1924), however, find no evidence for this conclusion. Man and Lukàcs and Freund and Jansson take granted that a separate sympathetic innervatio voluntary muscle has been established anato ally, but this, too, is now by no means gene accepted.

The situation of the central coördinating mecha has been approximately defined in some of the l animals by removing or severing successive por of the central nervous system from below upw and from above downwards, supplemented destroying limited areas of the brain and subsequ observing to what extent and in what manner the taxis was impaired. Many such experiments been vitiated by anæsthetics or complicated by s or irritation, and it is only from those in which animal had completely recovered from the opera at the time the observations were made conclusions can be safely drawn. The early obse tions of Pfluger (1878) on the condition of a dog

FIG. 1.



Influence of sojourn at an air temperature of 3° C. on the temperature of normal bitch and bitches with sectio the cord at different levels made some months previo Sherrington (1924).

section of the cord at the sixth cervical verte and many observations on man after lesions in region indicated that coördination was performed some portion of the nervous system above this le Kennaway and Pembrey (1912) studied the ther tactic ability and the respiratory exchange in r and rabbits before and after severing the cord below the brachial plexus. The section obliter the regulation of heat loss from the paralysed port but a considerable amount of control over l production remained. The animals' consump of oxygen was increased in their efforts to compen

r the greater loss of heat, and the authors assume at all this increased combustion was accomplished muscles of the portion of the body anterior to the tion.

More precise information of the effect of section the cord at different levels upon the ability of an imal to control its temperature has been afforded the experiments of Freund and Strassmann (1912) d Freund and Grafe (1912) on rabbits, d those of Sherrington (1924) upon gs.

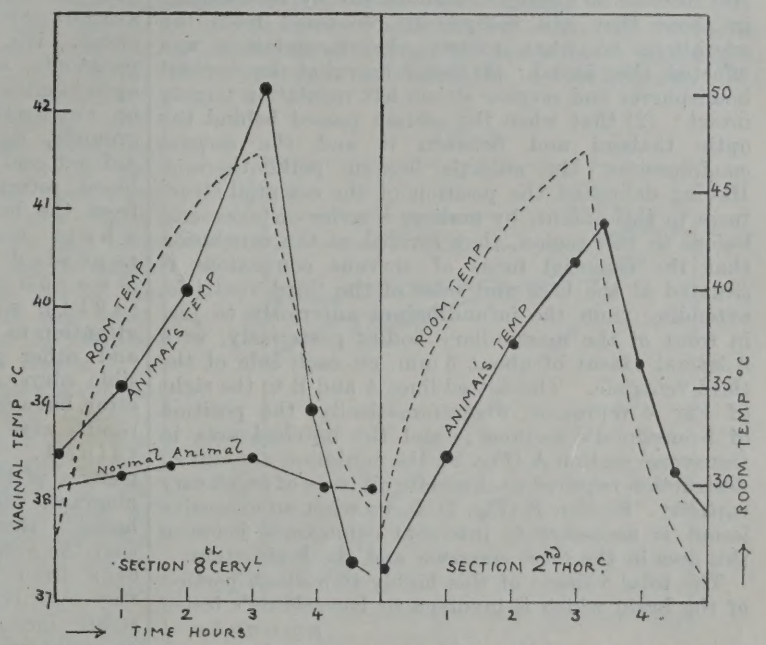
Sherrington's experiments are particularly convincing, as he had at his disposal animals in which spinal sections had been made from one month to one and a half years previously. The dogs were in good health but had to be kept in a room at 26° C. in order to maintain a body temperature of 37° C. Figs. 1 and 2 illustrate the effect of sections of the cord at different levels upon the animals' power to accommodate when their surroundings were cooled or heated. Observations upon normal dogs are included for comparison. The normal dog, when the temperature of the air was 2° C., coiled himself up to reduce his surface, roughened his coat to improve his insulation, diverted his blood flow from the surface, until his nose and extremities were cold to the touch, and shivered occasionally to increase his heat production; by these means he maintained his body temperature. The paraplegic dogs could only do all these things over a proportion of their body, diminishing as the level of the cord-section was higher. They were progressively handicapped by the greater extent of their paraplegic and poikilothermic portion, and their body temperature fell more or less rapidly. Gardiner and Pembrey (1911) have collected an interesting series of cases of traumatic section of the cord in man which illustrate the same fact.

In some further experiments Sherrington established that both shivering and the erection of hairs require a præspinal nervous apparatus, and that this can be stimulated by lowering the temperature of the blood, even when the remaining sentient surface of the skin is above the usual temperature. The converse holds for sweating, which occurs on stimulation of præspinal centres even when the surface is cold. This does not imply that either sweating or shivering are only produced by changing the temperature of the blood.

Sherrington's experiments did not include observations on the respiratory exchange and, apart from the termination of shivering, afford no information as to how far nervous control of production is handicapped by spinal section. This was done by Kennaway and Pembrey (1912), and has more recently been the subject of experiments by Freund and Grafe (1912). They agree with Pembrey and Kennaway that, in the rabbit, dorsal section by no means eliminates chemical regulation. They found that afterwards the rabbit consumes 30 per cent. more oxygen than before at the same temperature. This must be so if it is to maintain the same body temperature, for the heat loss from the paraplegic portion cannot be controlled.

The interest of their results resides in the discovery that if the section be made at the seventh cervical instead of at the second dorsal, or if after section at the second dorsal the cervical nerves are severed or the stellate ganglion removed, the animal behaves almost like a poikilothermic creature. By either of these procedures they will nearly have eliminated physical regulation from the whole of the body, but this does not account for their finding that afterwards the animal is not able to increase heat production, for the extra amount of musculature eliminated is not great. They are of opinion that between the level of the seventh cervical and second dorsal segments nerve-fibres emerge which pass into the sympathetic and are distributed to the liver and other glandular organs. That the thyroid was one such was an obvious inference, but they discard this interpretation as they found no further impairment of chemical regulation in a dog with dorsal section after thyroidectomy.

FIG. 2.



Effect of raising temperature of room from 26° to 46° C. on normal dog and bitches with section of the cord at eighth cervical or second thoracic level. Sherrington (1924).

Later Freund (1914), and also Plaut (1922), dissected away the nerves from the hepatic artery in dogs in which a dorsal section had been made. By this procedure the animals' capacity to increase heat production when cooled was further impaired, and they conclude that the suggested outflow into the sympathetic between the lower cervical and upper dorsal finds its way to the liver either with the vagus or along the vessels. This would indicate an unexpected origin and course, and the whole matter is far from clear.

Freund and Janssen's (1923) recent conclusions that nerve-fibres which leave the cord in the cervical region, join the sympathetic chain, and ultimately find their way along the artery to the muscles of the hind leg and control the combustion in these muscles, independently of the motor nerves, is difficult to accept. The experimental procedures upon which this "proof" was founded were very difficult and the protocols indicate that the errors of observation were great.

LOCATION OF A THERMOTACTIC "CENTRE" BY SUCCESSIVE ABLATIONS OF THE ANTERIOR END OF THE CENTRAL NERVOUS SYSTEM.

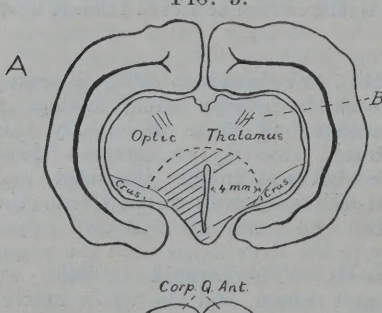
Goltz's famous dog, from which he removed the cerebral hemispheres and a good part of the *corpora striata* and optic thalami, lived 18 months and regulated its temperature. On the other hand, the usual method of decerebrating a dog or cat by passing a spatula along the tentorium to the base of the skull obliterates all trace of regulation. A decerebrate cat has been kept alive for five months by de Barenne (1919)

and one month by Bazett and Penfield (1922). These remnants of animals were poikilothermic and had to be kept in a room about 30° C. to maintain a body temperature of 40°. These observations limit the position of the central coördinating mechanism anteriorly to the region of the interbrain.

More precise localisation in the rabbit has been achieved by Isenschmid and his colleagues Krehl and Schnitzler (1912, 1914) (Figs 3, 4). By ablations and sections on a series of animals and by ascertaining in those that had completely recovered from the operations to what extent thermoregulation was affected, they found: (1) that removal of the cerebral hemispheres and *corpora striata* left regulation largely intact; (2) that when the section passed behind the optic thalami and between it and the *corpora quadragemina* the animals became poikilothermic. Having delimited the position of the essential structures to this extent, by making a series of transverse lesions in this region, they arrived at the conclusion that the essential focus of nervous connexions is situated at the base and sides of the third ventricle, extending from the infundibulum anteriorly to just in front of the mammillary bodies posteriorly, with a lateral extent of about 3 mm. on each side of the third ventricle. The dotted lines A and B to the right of Fig. 4 represent, diagrammatically, the position of Isenschmid's sections; and the hatched area in transverse section A (Fig. 3), the minimum amount of destruction required to eliminate all trace of regulatory capacity. Section B (Fig. 3) shows what an extensive lesion is necessary to intercept connexions between this area in the *tuber cinereum* and the brain stem.

The total volume of this highly important portion of the brain which is involved in Isenschmid's lesion amounts, I reckon, to about 0·1 c.cm. It is a region which has been shown by Hasama (1929) to be in connexion indirectly with several sympathetic outflows—e.g., vasomotor, pilomotor, pupilodilator, cardiac augmentors, and sweat glands. The afferent connexions of this nervous exchange are multitudinous. It is in connexion, through the optic thalami, with the nerves of temperature sense from the whole surface of the body and with many other sensory nerves too, for pain and cayenne pepper produce sweating. Also it must have connexions with the higher centres, for Gessler and Hansen (1927) find that in a hypnotised person the suggestion of coldness may produce vasocontraction in the skin, goose-flesh and shivering in a warm room, and that the suggestion that the patient will not feel cold may inhibit these manifestations when the rate of heat loss is sufficient to occasion a fall in body temperature.

FIG. 3.



Section just behind infundibulum in the rabbit. Hatched area is that required to abolish thermoregulation. (Isenschmid and Schnitzler: Arch. f. Exp. Path., 1914, lxxvi., 202.) B is 4 mm. below section A ventrally and 8 mm. below section A dorsally. Destruction of hatched area did not greatly impair thermoregulation. B.V.A. = Bundle of Vicq d'Azyr.

SENSITIVITY OF DIFFERENT PORTIONS OF THE THERMOTACTIC NERVOUS APPARATUS TO TEMPERATURE.

The peripheral endings of the nerves of temperature sense are not the only part of the nervous system which is sensitive to temperature. Kahn (191[illegible]) showed that warming the blood-supply to the brain by surrounding the carotid artery of a dog with a jacket of warm water produced acceleration of the heart-beat, dilatation of the peripheral vessels, and secretion of sweat. His experiments were open to criticism on technical grounds, as he did not cool the blood returning from the brain. They were repeated by Moorhouse (1911), with attention to this and other possible sources of error, but similar results were obtained. By using a plethysmograph Moorhouse showed that the volume of a limb was very sensitive to small increases in temperature of the blood supplying the brain, and that these increases were observed before the augmentor action on the heart.

FIG. 4.

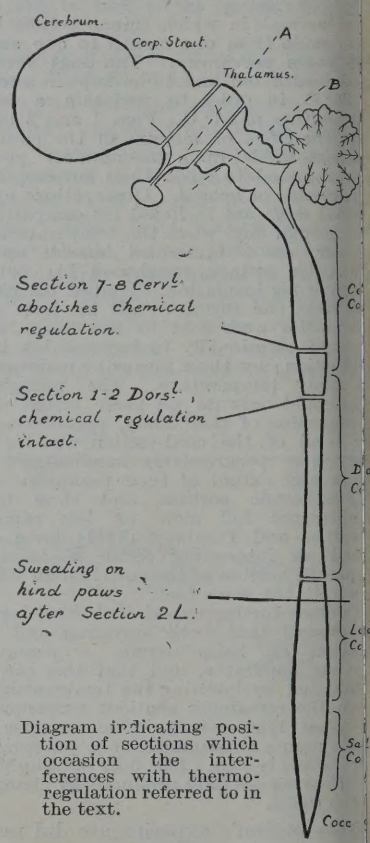


Diagram indicating position of sections which occasion the interferences with thermoregulation referred to in the text.

That the thermotactic apparatus at the base of the brain is sensitive to temperature and responds so as to regulate both heat production and heat loss was most satisfactorily demonstrated by Barbour (191[illegible]) who introduced a double cannula through a trephine opening in the skull of a rabbit down to the base of the lateral ventricle. The operation was performed aseptically and, by an ingenious technique, the cannula could be left in situ and the animal allowed to recover from the anæsthetic and the initial disturbance. When cold water was circulated through the cannula, vasoconstriction of the vessels of the ear was obvious, the oxygen consumption increased (Barbour and Prince (1914), and shivering occurred although the body temperature of the animal was above normal. On the other hand, the circulation of water a few degrees above that of the body gave rise to flushing of the skin and diminished the oxygen consumption.

The significance of Barbour's experiments has been belittled because he found it necessary to use water 5° C. above or below the temperature of the brain in order to produce the effects. That criticism appears to me unjust. The end of his double cannula was only somewhere in the neighbourhood of the sensitive nerve-cells of the thermotactic centre subsequent

limited by Isenschmid, and generally in the lateral ntricle. It was surrounded by brain tissue through ıich blood was circulating. In 1914 I repeated ırbour's experiments, but not always successfully. obviously did not always hit the right spot. I ınd that his double cannula destroyed too much ain tissue, and I was more successful with a fine ıstic catheter with a solid silver tip enclosing a ıe metal inflow tube about 1 mm. bore. In the llowing year Hashimoto (1915) also repeated ırbour's experiments, but used a double cannula both sides of the brain. Under these conditions was not required to employ water so hot or so cold Barbour found necessary to obtain his effects. ith this bilateral arrangement Hashimoto could ol one side and heat the other, and then sometimes oduced constriction of the vessels in one ear and latation in the other. Barbour's observations were nfirmed for the cat by Prince and Hahn (1918). y placing a hind leg in a plethysmograph they were ıle to show that the volume of the leg increased diminished according to whether the base of the ain was heated or cooled. This did not occur ter removal of the skin, indicating that the vascular sponse was confined to the superficial vessels.

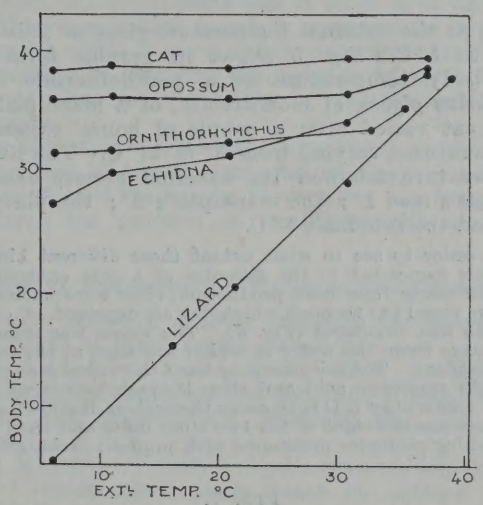
So far I have emphasised the proofs that the central echanism of thermoregulation is itself sensitive temperature, and so organised that it discharges pulses through appropriate nerve channels accordg to whether its temperature rises above or falls low a predetermined level. The mechanism is, wever, more elaborate than this. Instead of waiting r the blood temperature to rise or fall, and meanıile wasting calories, adjustment can be brought out reflexly from the surface. The centre is in nnexion with the nerves of temperature sense from e skin, and responds with rapidity by efferent ıpulses which modify heat loss from the surface or, aybe, by others which result in an increased or minished production of heat. It has been suggested at such coördinated reflexes could themselves hieve homœothermism, and the importance of the ct that the central nervous machinery is also directly nsitive to temperature is minimised by some ıysiologists. Consideration will, however, show that rect sensitivity of the centre is essential. A reflex echanism to diminish heat loss and increase produc-n when the skin cools would work progressively ıd the temperature inside would rise. In fact, rigor would occur. The reverse would happen if ısodilatation in the skin occurred in response to armth. The skin would become progressively armer and the body temperature fall.

There must be some mechanism to control these flexes as soon as they have accomplished their ırpose, and I suggest that it is the direct influence the slightly warmed or cooled blood reducing the nsitivity of the appropriate parts of the central paratus to stimulation by impulses arriving by one th or another.

The conception of the central nervous mechanism r thermoregulation which best interprets physiogical, pathological, and pharmacological observations d experiments is a slight elaboration of one put rth by Hans Meyer (1913). Meyer regards the ermotactic nervous apparatus in the *tuber cinereum* be composed of two coupled nerve centres alogous to the inspiratory and expiratory centres r respiration. One of these he calls the thermogenic, e other the thermolytic centre. Each is sensitive appropriate, direct, and reflex stimulation, their fferent connexions being such that antagonistic sults follow. Meyer supposes that stimuli activating the thermolytic centre at the same time inhibit the thermogenic, and vice versa. The thermogenic centre must, however, be associated with yet a third collection of nerve-cells, impulses emanating from which occasion a sparing of heat loss by constricting superficial vessels and erecting hairs, for the first and sometimes the only response to impulses along nerves from " cold spots " on the skin is to economise heat loss in this way. For this piece of nervous apparatus I suggest the term thermopheidic centre ($\phi\epsilon\iota\delta\omega$ = thrift).

In this survey I have not yet exhausted the means available to an animal for temperature adaptation. Both thyroxin and adrenalin are calorigenic. The

FIG. 5.



Variation of body temperature of different types of animals by sojourn for two hours in an environment of 5° to 35° C.

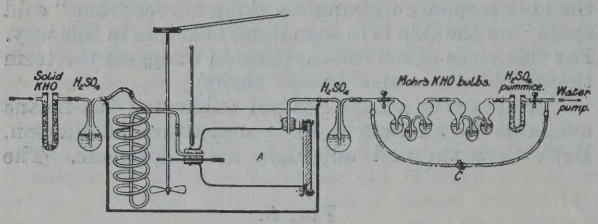
former is slow in action but the effect is prolonged. W. Cramer (1916, 1918, and 1919) has demonstrated by his histochemical method that both the suprarenals and the thyroid are stimulated by cold to excessive activity. This has been confirmed for the former by the Hartmans (1923) and more recently by the convincing experiments of Cannon and Querido (1924), and for the latter by Mills (1918) and Hart (1922) from histological changes in the gland. Boldyreff (1913) showed that a dog after thyroidectomy, was handicapped in protecting itself against cold, and the same disability was demonstrated by Kovenchewsky (1926) in rabbits. The importance of this indirect humoral method of regulating heat-production is championed by Cramer (1916), Meyer (1920), Aub, Forman, and Bright (1922), and Cannon (1925).

History of Homœothermy.

It may be safely assumed that the present perfection of thermal adjustment possessed by the higher mammals was acquired gradually, but most of the types of animals which may have possessed the faculty in a rudimentary form have disappeared from the face of the earth. There are, however, in Australia two interesting creatures with many characteristics intermediate between mammals and reptiles. I refer to the monotremes, which have a cloaca, lay eggs, and suckle their young. It seemed to me that an examination of their thermotactic capabilities might be interesting, and when in Melbourne I made some experiments with this object (Martin 1902). Both the monotremes have temperatures considerably lower than mammals. The duck-billed platy

Ornithorynchus paradoxus, maintains a fairly constant temperature provided it is not too hard put to do it, but the ant-eater, *Echidnia hystrix*, is really intermediary; its temperature varies 10° C. (18° F.) or

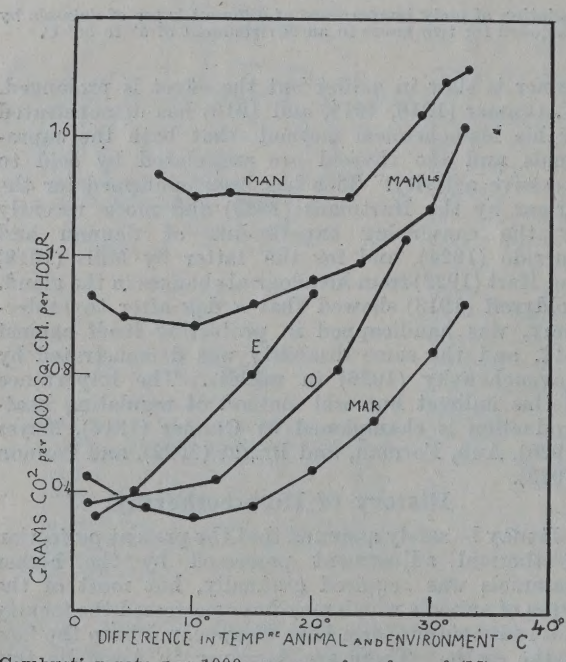
FIG. 6.



more as the external temperature rises or falls from 30° to 5° C. Fig. 5 shows in graphic form how the body temperature of a poikilothermic lizard (*Cyclodus gigas*), of monotremes, of a marsupial and of a cat varied after a couple of hours' sojourn at temperatures varying from 5° to 37° C. The lizard's temperature followed the external almost exactly; the cat's rose 1°; the marsupial's 2°; the platypus' 4°, and the echidna's 8° C.

In order to see to what extent these different kinds of animals responded to the stimulus of a cold environment by increasing their heat production, they were enclosed in a glass vessel (A) through which dry air deprived of carbon dioxide was circulated (Fig. 6). The vessel was immersed in a large bath, the water in which was kept at the desired temperature. The air emerging from the vessel was passed through sulphuric acid and then through two large Mohr bulbs containing K O H to catch the carbon dioxide formed. The increase in weight of the two Mohr bulbs and the U tube containing pummice moistened with sulphuric acid, afforded

FIG. 7.



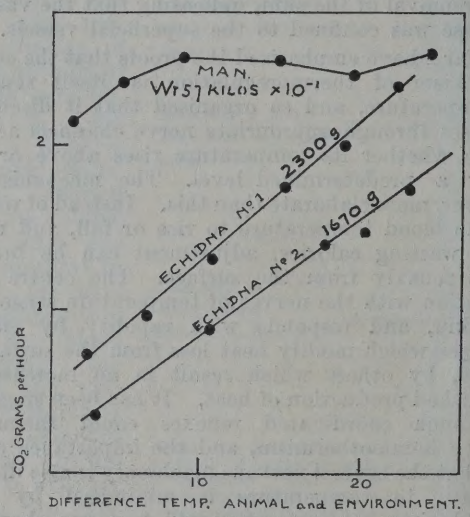
Combustion-rate per 1000 sq. cm. of surface of (M) mammals (cat and rabbit), (E) echidnas, (O) ornithorynchus, and (MAR) marsupials, according to the difference in temperature between them and their environment. The graphs represent the average results of several experiments. The observations on man were made by Voit (1878).

a measure of the carbon dioxide formed by the animal during the period.

Fig. 7 shows graphically the variation in combustion in the animals according to the difference in temperature between them and their surroundi together with that of a clothed man, observed Voit (1878) under somewhat similar conditions. rate of combustion is expressed in grammes of carl dioxide per hour per 1000 sq. cm. of surface. T is done because the animals were of different si and in the same kind of animal of the same combustion varies nearly in proportion to its surfa

The cost in fuel of the various animals for the sa external temperature varies. This is partly accoun for by their insulation, partly inherent in them. I particularly noticeable at higher external temperatu when man is expending five times as much energy a marsupial, wastefully and to his discomfort. contrast to all the other creatures, it was not u the external temperature fell below 14° C. t Voit's man varied his heat production at all. T echidna evidently utilises chemical regulation m (without, however, achieving a constant temperatu then the marsupials, and the cat and rabbit le until the external temperature falls below 10°

FIG. 8.



Combustion-rate of the monotreme *Echidna hystrix* compa with that of man according to rate of heat loss. The obser tions on man were made by Wolpert (1898).

The curves are composite ones for several anim of the same kind. Fig. 8 illustrates the carb dioxide production of two echidnas and a man plott against difference in temperature between inside animal and environment. The ordinate for the m is divided by 10. The combustion in the echidna within the error of such an experiment, proportion to this difference, whereas the combustion for the m is largely independent of it. The echidna has sweat glands. It does not pant when it gets h although it shivers violently with cold. As it do not seem to have means of varying the wat evaporated, if its combustion is proportional difference in temperature between it and its enviro ment, it is varying production closely in proporti to loss, a fact which suggests that this is the on means of adjustment employed.

Regulation of temperature by varying producti would seem, therefore, to have been the first meth arrived at in the development of homœothermis It is the cheapest, but is no protection against hi air-temperatures. At an external temperature 35° C. an echidna soon succumbs. A boc temperature of 39–40° is incompatible with lif In their natural conditions echidnas burrow, and

ɔt weather emerge only after sundown. In the winter ey hibernate, and reduce the expense of existence a minimum.

If chemical regulation is phylogenetically the more ıcient method it should, in accordance with bio-gical principles, precede regulation by varying loss the development of the young animals. Pembrey 894) studied the power of adjustment to temperature ɔssessed by the embryo chick in the egg and that the chick after emergence. He found that up to e eighteenth day a chick in the egg behaved like cold-blooded creature, and that its carbon dioxide oduction rose and fell with the temperature of its rroundings. At the nineteenth and twentieth day began to do the opposite, and before leaving the ell had already acquired a considerable capacity to ry heat production in response to external tem-rature. One day after hatching, a chick was found double its carbon dioxide production when its vironmental temperature fell 20°. Pembrey (1895) so made similar observations on mammals which e born in different states of immaturity. He und that they all possessed some power of regulating at production, varying according to the stage of velopment they had attained when they commenced eir extra-uterine existence. As he did not make rect calorimetric observations, Pembrey's experi-nts do not decide when physical regulation first pears. This has, however, been done by Babak 902) on new-born babies. From his observations concludes that physical regulation is not yet anifested at birth, but is gradually developed a few ys afterwards.

A REVIEW OF THE TREATMENT OF ASTHMA.

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THIS paper is based upon the study of the treat-ent of some 60 children, with asthma of all types. ɔ disease can show a more diverse and baffling erature and to the casual observer the differing atements of the various camps must seem almost licrous.

In a recent paper, however, McDowall [1] has shown at all may be partly right. Assuming that bronchial nstriction is the main symptom of asthma, he mmarises the various methods by which this may brought about —viz.: (1) *Directly*, by the inhalation irritating gases. (2) *Chemically*, by histamine d peptone. (Here he describes a biphasic reaction the part of the bronchi to these substances, the st being an immediate contraction, the latter a layed and much more profound relaxation.) *Nervously*, through the vagus. (The vagus may stimulated psychically by suggestion or reflexly rough the fifth nerve by irritation of the mucous mbrane of the nose.) McDowall quotes some portant experiments of his own which show that reign proteins have a profound influence on the gal system. The injection of foreign proteins ɔ certain animals tends to hypersensitise their gal systems and in certain cases leads directly to ɔnchial constriction.

If we examine the different treatments of asthma this light it is possible to see that one and all, under tain circumstances, can be of theoretical value. ptone, administered intravenously, between attacks small enough doses will fail to give its primary reaction of constriction and only give its more powerful secondary reaction of relaxation. Psychotherapy will remove any psychical stimuli which may "start off" a hypersensitive vagal system. Operation on the nose, in cases of nasal defect, will remove the local reflex through the fifth nerve to the vagi. Hydrochloric acid and pepsin, by aiding digestion, particularly in cases of achlorhydria or hypochlor-hydria, will prevent the absorption of the allergising protein molecules into the blood stream. Specific elimination of offending proteins will remove the patient from contact with the allergising substance, and desensitisation, by repeated injections of minute quantities of the allergen, will produce a temporary circulating antibody. The action of glucose is not clear, but Oriel claims that it tends to steady the unstable metabolism found in a particular type of asthmatic child. X ray therapy and protein shock act presumably by changing the body chemistry tempor-arily in some way, possibly by the production of histamine.

By accepting McDowall's hypothesis as the true explanation of the fundamental ætiology of asthma we can discard the narrow view of any one camp and approach the problem of treatment with an open mind.

Logical Sequence of Various Treatments.

It now becomes possible to group the recognised treatments in their logical sequence :—

(*a*) *General measures.*—Under this heading is included the general care of the child's health, both mental and physical—e.g., sufficient rest, diet, and exercise.

(*b*) *Measures to remedy faulty digestion and metabolism.* Bray [2] holds that many cases of asthma have a reduction or absence of hydrochloric acid. In these cases he claims that great benefit may be obtained by giving a mixture of hydrochloric acid and pepsin. Oriel [3] describes a type of asthmatic child in which the asthma is associated with other allergic conditions, such as eczema and cyclic vomiting, and in which the blood chemistry shows a high amino-acid content and a low blood-sugar. These cases, he states, show an unstable metabolism alterna-ting between an acidosis and an alkalosis. He claims that glucose given in large quantities (four ounces per day) will help to steady the metabolism of the child and cause cessation of attacks.

It is clear, therefore, that a careful study of the child's body chemistry should be made in all cases, and where conditions as described by Bray and Oriel exist their treatment should be adopted. In some patients these types will no doubt overlap, in which case a combination of glucose and hydrochloric acid may well be tried.

(*c*) *Measures to rectify nasal defects.*—A skilled rhinologist who has made a special study of asthma should examine all cases. He will be able to select a number where a deviated septum, hypertrophic rhinitis, or sinus infection is the causal factor and which can be cured by operative procedure. The diagnosis of cases due to infection of the upper respiratory passages is more fully discussed below.

(*d*) *Psychotherapy.*—In children it is very rare for the primary cause of asthma to be a neurosis, the curing of which leads to cessation of attacks. I know of three patients cured by psychotherapy, but they were all women between 40 and 50 years of age. However, we must include the breaking of the "habit" of asthma under this heading. It is essential to treat the attacks efficiently so as to dispel fear from the child's mind, and to continue

investigation until we find some method of treatment which will lead to cessation of attacks, if only for a while, as auto-suggestion plays a very big part in the causation and confidence in eventual cure is essential.

(*e*) *Specific diagnosis of allergic type.*—This is best accomplished by a comparative study of the physical examination with a special history and a subsequent number of skin tests. Large numbers of skin tests by themselves are of little value and are often misleading. This method has been much abused in the past, unfortunate patients having been subjugated to over 100 such tests by the "specialist" without any clear rationale.

By these means the allergic type may be divided into main sub-types depending on the kind of allergen to which the patient is hypersensitive and its mode of entry into the body—e.g., respiratory and alimentary other than bacterial, and bacterial products from foci of infection. The sub-types may be yet further sub-divided according to the actual allergen or allergens involved. The Table shows some 33 cases

Table of Types.

Bacterial.	Respiratory.				Multiple.	Total.	Diagnosis.
	Epidermal.	Pollen.	Food.	Dust.			
							History.
5	0	0	0	2	*5*	12	Winter.
0	0	*4*	0	0	0	4	Early } Summer
0	0	*3*	1	1	2	7	Late }
0	0	*2*	0	5	0	2	Locality as factor.
6	0	1	0	0	2	9	Infections as factor.
0	0	6	0	0	1	7	Pollens } possible
4	*2*	4	0	5	9	24	Epidermals } factors.
1	0	0	1	0	1	3	Foods }
0	0	1	0	1	*4*	6	Allergic history.
2	1	3	0	4	*7*	17	Allergic family history.
							Physical Examination.
0	1	0	0	0	3	1	Emphysema.
3	1	2	0	1	8	15	Chronic bronchitis.
7	1	0	—	1	0	9	Tonsillitis or adenoiditis.
3	—	1	0	0	1	5	Sinusitis.
							Skin Tests.
0	2	0	—	1	2	5	Cat } Epidermals.
0	0	0	—	0	*1*	1	Dog }
0	*1*	3	—	*5*	*13*	22	Feathers }
0	0	0	—	1	*4*	5	Orris root.
0	0	0	1	1	*3*	5	Egg . . Foods.
0	0	*5*	—	2	*9*	16	Ragweeds } Pollens.
0	0	3	—	0	*5*	8	Grasses }
0	0	1	—	6	*5*	12	Dust.
7	2	6	1	5	12	33	

worked out on these lines. They were all tested with extracts made up in the hospital laboratory; previously, extracts supplied by two well-known firms had been used with only very partial success. All the cases included were studied for over 12 months, and although the Table is far from perfect it serves to demonstrate a number of important points.

In this Table all the bacterial cases are from the respiratory passages, for I was unable to demonstrate intestinal infection as the causal factor in any of my cases. The respiratory group is divided into three sub-groups—viz., epidermal, pollen, and dust (the dust referred to was obtained from sweepings from the patient's own houses). Only one case was demonstrated to be hypersensitive to one food, and one only, and hence most of these cases fall into the multiple group.

For the sake of simplicity, only a limited number of skin tests have been included. Skin reactions to bacteria are brought about by a different mechan than that of the other protein cutaneous reactio the former occur at once and are probably a nerv reflex, while the latter do not reach their maxim for 24 hours, being of serological origin, and he have been excluded from this Table.

If the Table is studied the frequencies will be s to fall into definite positions in the different gro showing a correlation between history, phys examination, and cutaneous reactions. For exam most of the bacterial cases occur in winter, associated with chronic infection, and give gener negative skin reactions, while the pollen type oc in summer and shows a marked skin hypersensiti to pollen.

TREATMENT AFTER DIFFERENTIAL DIAGNOSIS.

The first five sub-groups should be treated specific desensitisation and elimination. For succ ful treatment of bacterial cases the closest coöperat between the nose and throat surgeon and the physic is essential. It is not sufficient to hand over th cases to the former with the tentative diagnosis "infection," for it often impossible for the surg to tell which is primary in cases of nasal de associated with asthma. In the cases operated u the morbid remains or washings should be set as and cultured; from these cultures vaccines sho be prepared by growing the organism in broth 24 hours and then killing it by heat and carbolis it. By these means the exotoxins are retained well as the endotoxins. Subsequently the pati should be treated by injections of minute doses of diluted whole broth culture. All the bacterial ca in my Table were treated in this way; three cea having attacks altogether, in one the attacks ten to recur after eight months, two were much improv while one remained unchanged.

The epidermal, pollen, dust, and food sub-gro should be treated by elimination, and desensitisat by inoculation at weekly intervals with minute do of the offending antigen. As in the case of hay-fe it will be found that the immunity thus procu is but temporary, and tends to pass off in from to eight months after the course of treatme About half my cases showed this tendency. second and if necessary a third course of "desensit tion" should be tried in these cases. This type asthma is analogous with hay-fever. In the latte has been found almost impossible to desensitis patient in the presence of the antigen. It is which makes the treatment of asthma by desensit tion so difficult, as it is often impossible to rem the patient from contact with the offending prot (antigen) while desensitisation is in progress.

It is doubtful if we are actually desensitising patient by this means. In hay-fever and asthma skin reactions often remain positive during treatm although they may vary in intensity. It is, therefo more probable that we are merely producing a te porary antibody in the blood, and that when this g used up the attacks tend to recur once more, the fore protein being able again to reach the hypersensit cells. Weil[4] has shown, in experiments on guinea-p with anaphylaxis, that the anaphylactic state m be masked temporarily by the injection of sm amounts of the antigen producing a temporary hom logous antibody. In this connexion it is interest to note a possibly analogous condition with bacterial allergy described by Swift and co-worke They have shown that bacterial allergy is not altoget specific and that groups of organisms produce a gro allergen. Dochez [6] describes both specific and n

ecific allergens from bacteria. In cases of multiple persensitivity it has often been observed that sensitisation to one allergen will cause cessation attacks, even when the patient is exposed to her allergens to which he is still sensitive. The ccess of W. S. van Leeuwen's tuberculin treatment n thus be explained. Tuberculin is a very powerful ergen, and when given in minute doses—e.g., rting with 0·1 c.cm. of one millionth O.T.—it is rely such a method of desensitisation.

The multiple sub-group in this Table comprises per cent. of the total. Actually in England, ere pollen asthma is rare in children, it would be least 50 per cent. It is difficult to say what actual rcentage of all cases attending an asthma clinic London would fall into this sub-group, but I uld venture to say that they would be at least per cent. It is clear that cases cured by more neral measures, already referred to, although they ay have been multisensitive, are not now included this sub-group. It is the problem of what to do th this multisensitive type of case, often indeed e most severe, which has taxed the asthma specialist the past, and it is here, I think, that non-specific erapy has a place. Of 14 cases treated by non-ecific therapy of which I have full notes, 3 ceased ving attacks altogether, 2 tended to recur after ght months, 3 were much improved, and 6 were improved. In the literature all forms of non-ecific treatment have adherents. Non-specific sensitisation to tuberculin or some other allergen easily carried out. X ray therapy, where possible, slightly more efficacious; either of these treatments ay well be tried. Peptone and like compounds are t advisable, as they may lead to dangerous results very hypersensitive cases. Protein shock tends lead to deterioration of the child's general health d is not to be recommended, except as a last resort.

Although discussion of palliative measures is not rt of this paper, control of the actual attack is of ch fundamental importance in the treatment of the ole condition that it is necessary to mention it. this connexion two drugs, adrenalin and ephedrine, th strong sympathetic stimulants, must be primarily nsidered. Adrenalin will cut short the attack at ce if given in large enough doses hypodermically. no case should more than ℥3 be given in the first ace to a child, but if this does not produce the sired effect another ℥3 may be given at the end of minutes, and so on until the worst of the spasm is ieved. Ephedrine has the advantage that it may given by mouth or in the form of a nasal spray, d hence can be used by the patient without call on the doctor or nurse; 0·025 g. of ephedrine lphate may be given with safety by mouth, or a per cent. solution of the chloride as a spray. The ter is of particular value in cases of pollen asthma d those associated with nasal defect. I have used is drug in over 50 cases with excellent results and ve not found it upsetting to the child. This ay have been due to the fact that we were using a ecially pure preparation sent us from the pharma-logical department of the University of Peking. ay and others have not reported equally successful sults from the preparations commonly used in is country.

There are many time-honoured methods of treating e attack, chiefly by inhalation of compounds ntaining stramonium or lobelia, but none compare efficiency with adrenalin or ephedrine.

It is possible, then, to provide the patient with such effective defence against the acute spasm of asthma at fear of the attack may be largely overcome, a factor of the greatest psychological importance in the general treatment of the disease.

The work referred to in this paper was done while holding a Rockefeller Research Fellowship. I wish to thank Dr. E. A. Park for allowing me to use cases from the Children's Department of the Johns Hopkins Hospital, and Dr. L. H. Gay for his help and advice.

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PRURITUS ANI ET VULVÆ.*

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AND
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THE causes of pruritus ani et vulvæ are many and varied. Some of these, such as eczema and certain dermatoses, are obvious upon inspection, or, at any rate, become so after a comparatively simple examination, while the dependence of the distressing condition upon constitutional reasons, such as diabetes, the gouty diathesis, and changes in adjacent structures, including piles and enlarged prostate, are well known. Other contributory factors may be the climacteric period, colitis, constipation, certain articles of food, oxyuris, pediculi, and, of course, affections of the rectum or vagina. Pruritus, which has an underlying bacterial origin, be it *Bacillus coli*, *Streptococcus fæcalis*, or *Staphylococcus albus*, is familiar, and a mycotic variety, due to epidermophyton and trichophyton, can sometimes be demonstrated by careful and repeated microscopic examinations.

There is, therefore, a great variety in the known ætiology, but the pruritic condition is often met in which diligent examination fails to find a cause. These cases are attributed to disease of the nerves or interepithelial nerve-fibrils supplying the affected areas. Many cases without any discoverable ætiological factor will become intelligible when laboratory methods have advanced. Already it is a reasonable belief that there is no such thing as pruritus sui generis.

Symptomatology.

The symptomatology of pruritus may be epitomised with the one word "itching"; all the signs and symptoms can be traced to the violent scratching to which a patient resorts in order to find relief. The itching is usually paroxysmal, as a rule worse at night when the patient is warm in bed, and in the early morning owing to secretion of mucus. The disease is more common in men than in women, and being a more frequent affection of the well-fed and well-to-do, is oftener seen in private than in hospital practice. The excoriations, the little cracks and fissures, the ulcerative and pustular lesions, indurations, and eczematous appearances are all due to this cause; local mischief may be originally due to any of the reasons set out, but is then exaggerated by the scratching. The itching is often of a severe type, and may lead to far-reaching irritation and to the more serious consequences of insomnia and

* Read on August 6th before the Eighth International Congress of Dermatology and Syphilology at Copenhagen.

melancholia; even insanity and suicide, though remote probabilities, have to be borne in mind, as well as the possibility that we are dealing with a prodromal symptom of malignant disease. Fearful of the onset of a paroxysm the sufferer withdraws from his or her fellows. Irritability and loss of temper on trifling occasions are common, and these patients are apt to become morbid and morose, even though there are no more serious mental manifestations. In pruritus of mycotic origin there may be seen minute red, slightly raised, infiltrated patches in the peri-anal region, occasionally arranged into two curved lines.

The pruritic area is reddened, and the fissures and cracks are usually small and moist. When they affect the area of skin surrounding the anus, puckered up by the action of the corrugator cutis ani, they can only be seen when the skin is put upon the stretch. Not only the peri-anal skin may be affected, but the irritation may extend to the scrotal area and also up the abdomen.

All the symptoms have been much observed and recorded, and their recapitulation must be excused because all have to be watched for in the treatment of this obstinate malady.

Treatment.

The successful treatment of pruritus taxes therapeutic ingenuity, and the reason for so many failures, partial or total, is that the attention to detail—without which success is often impossible—proves tedious both to patient and physician alike. But most patients will willingly submit to prolonged temporary inconvenience when accompanied with improvement, however slow, rather than have recourse to surgical interference—Ball's operation being the recognised operation.

Consider the local complications which it may be necessary to treat. Among these are chronic constipation, hæmorrhoids, ulcers, enlarged prostate, discharges (including irritant urine or fæces or even leakage of petroleum), caruncles, persistent Pacinnian bodies, hypertrophied anal papillæ, and any co-existent skin diseases, such as eczema. Of course, attention must be paid to the general health of the patient. It is sometimes found that in his diet there is something, perhaps a favourite food, towards which he is showing an evil idiosyncrasy. Moderation in alcohol and tobacco will be found beneficial. Especially, every effort should be made to restore sleep when insomnia is present. Luminal is useful, and it should be remembered that opium and its derivatives often not only fail to give relief but actually aggravate the irritation. Direct treatment falls under the two groups comprised in physiotherapy.

The small cracks which are of so frequent occurrence may be treated by means of ultra-violet radiation and X ray, but they may also be healed by painting them with friar's balsam or touching them lightly with a stick of silver nitrate. The treatment *must* persist until the most careful examination fails to reveal any trace of erosion. Those which are associated with pruritus of mycotic origin are more amenable to collosol iodine oil or tr. iodi (half strength), or mitigal, an organic sulphur preparation (Schottmuller), or some such prescription as Deek's ointment half strength.

The formula for Deek's ointment is:—

℞	Salicylic acid	4 parts
	Bismuth subnitrate	10 ,,
	Mercury salicylate	4 ,,
	Oil of eucalyptus	4 ,,

Vaselin and lanolin equal parts up to 100 parts.

As a general cooling lotion, and to ease the erythe after ultra-violet radiation (when erythema ou to be produced), a calamine and zinc oxide lotio invaluable, and may be dabbed on the affected a two or three times daily. The need must be impres upon every patient of thorough washing after e defæcation with some soap such as the germici soap of Parke, Davis, or Crooke's Collosol argent soap. After this the parts should be gently dr with salicylic acid wool and calamine lotion appli

Should any cracks or excoriations persist—a they often will, so that patience and perseverance requisite—then the use of an ointment such as following is recommended:—

℞	Hyd. subchloridi	2 drachms
	Bismuth subnitratis	1½ drachms
	Tr. aconiti	8 minims
	Glycerini	2 drachms
	Unguenti sambuci	up to 1 oz.

to be used night and morning.

When a paroxysm of irritation is threatened 2 per cent. carbolic lotion with spirit and rosewa will often abort an attack. The lotion should be k at the bedside. Pinching the irritable parts does mu less harm than scratching, and affords equal reli patients will soon learn the importance of t suggestion. Should the parts get sodden with characteristic unpleasant smell, dry calomel pow will prove serviceable.

Coming alike under general dietetic and spec treatment the value must be remembered of recou to spas like Harrogate, Luchon, Aix-les-Bai Schinznach, and many others. Here special appara directs a fine rose spray of warm sulphur wat once daily, for five or ten minutes locally agai the irritable and often excoriated anal region, affordi very great relief. The ordinary routine spa treatm will certainly also be of benefit. In cases of pruri where the cause is believed to be bacterial, vacc treatment must be borne in mind. An autogen vaccine may be prepared from a culture made fr scrapings taken from the affected anal area. For details and dosage of this one must be guided by bacteriologist.

Radiological Therapy.

The treatment of obstinate pruritus calls for w in which the dermatologist may find a useful coll orator in the physiotherapist. Radiology offers the dermatologist one of the most valuable adjuva in the treatment of pruritus ani et vulvæ. It is agent which eases the hyperæsthesia and allays irritation, and inasmuch as it possesses a stimul and bactericidal action it has a definite curat influence; used with intelligence, it is incapable producing any harmful effects. In pruritus, as many skin diseases, nearly a 50 per cent. benefit obtained if general irradiation by ultra-violet li of the whole body be added to local treatment, wh there is not only the bactericidal and other lo action, but there is, added to it, the general buildi up of the resistance of the patient which has be lowered by the continuous irritation and often resultant insomnia. The probability of success increased by half as much again through giving general body bath, twice or three times weekly. these baths the calcium content of the body is rais Dr. Agnes Savill [1] says: "Calcium lactate is so of useful in these cases"—which may be the rea for the good effect of the general body bath of ult violet light radiation. Ultra-violet radiation exe a biological action in the neighbourhood of int

[1] THE LANCET, 1929, i., 731.

ithelial nerve-fibrils, and if the pruritus be caused the *Staphylococcus albus*, *Streptococcus fæcalis*, *cillus coli communis*, or such mycetes as the idermophyton or trichophyton, then the lethal ect of radiation will readily account for them.

The affected area should be viewed with a magnifyg lens in a good light, and possibly tested with a all ultra-violet light, through a Wood's filter, in der to show any slight cracks or minute fissures to demonstrate the presence or absence of fungoid sease. Scrapings should be taken, and other ans for pathological examinations conducted, so to furnish the bacteriologist with all the material quired, and if, as will often happen, a negative port be obtained, examinations should be repeated veral times.

The patient should be prepared for local treatment. France, especially since treatment with the various ms of rays has come into use, shaving is usual ere the conditions have invaded the hairy skin. The rts having been shaved, they should be thoroughly ansed with soap and water and carefully dried. y crusts should be removed with the hands, in bber gloves if preferred, the parts should be smoothed t, and held apart so that the folds or deeper parts the recesses may become exposed to the treatment.

The treatment must of necessity vary with each lividual, and with the length of time which the ease has lasted. It should begin with an exposure ultra-violet radiation. The most convenient method application to these regions is by means of the omayer water-cooled lamp. It is impossible to down the precise dose, as there are so many tors which vary it. The lamp may be used at a tance of two or three inches, with a four-minutes posure, or it may be placed in contact with the n, the duration of the exposure varying inversely th the square of the distance. After a period rying from four to six hours a reaction and an rthema should appear. In pruritus vulvæ the tient should be warned that this reaction may be fficiently severe to render it advisable that she ould stay in bed for a day—possibly two days, t her previous sufferings will usually cause her erfully to assent to a temporary suspension of her lking activities. The counsel of perfection is that second application of ultra-violet rays should e place as soon as the erythema has subsided, l the distance remaining the same the time should increased by one or two minutes, according to the asure of erythema produced. Where, owing to patient living far away from the practitioner, from any other cause, the successive treatments not be regulated by the disappearance of the thema, then it has been found a useful rule give one ultra-violet ray treatment in the first ek and two treatments in the second, and one atment every week thereafter. Six or twelve atments are usually needed. The first treatment ays irritation to some extent, not because all the teria or fungi are destroyed or other cause removed, t because the light acts as an analgesic to the nervelings. Ultra-violet rays will often heal the small cks and fissures so often revealed when the rays passed through a Wood's filter. Once recognised y are easily cured by the application of the ap in contact with the lesion, employing a quartz plicator. It must be repeated that the healing these cracks is essential to successful treatment. the time of treatment the patient should be told expect an erythema to appear, and the lotion y be given to allay the irritation. This irritation, should be explained, is a necessary and salutary concomitant of the treatment; if this warning be not given, the patient may complain of a "burn."

The toilet of the pruritic area is of the first importance. The area must be kept scrupulously clean—there is much to be said for the universal use of the *bidet*, rarely seen in our country. The lower bowel must be kept empty by any mild aperient to which the patient may be accustomed or by an enema or glycerin suppository. In some cases a course of Plombière douches twice or three times weekly is of great advantage.

X ray treatment of pruritus continues to be a success; its disparagement has sometimes come from those without adequate experience, based upon some improper employment. In THE LANCET nearly six years ago, in one of the special articles on Modern Technique in Treatment, a paper by Dr. Louis Savatard contains the following passage:—

> "Radiation by means of the X rays I now use as the routine method of treatment for pruritus ani. Not only have the rays a marked antipruritic action, but they also reduce induration of the skin. X rays seem to have entirely suspended surgical division of the nerves, and not a few cases which have recurred after operation have remained permanently well after but a few exposures to the X rays." [2]

Our own experience is that X rays are of the utmost value in pruritus, especially in cases of long standing. The rays are directed into the anal area, perineum, and, in woman, to the vulvæ. The treatment may be given with the patient lying on the side on a couch, but I (F. H. H.) have found it more convenient to use a special stool invented by Curtis Webb, which can be placed over the X ray tube. In the seat is a circular aperture, $4\frac{1}{2}$ inches in diameter, through which the rays are directed. When the patient is seated on the stool the affected area can be accurately centred and the cheeks of the buttocks easily separated and maintained in position. In males the testicles are protected by a sheet of lead on the seat. The best results have been obtained with fairly soft rays given in divided doses. I use an equivalent spark gap of 5–6 inches, unfiltered, for the first three treatments, and for the last three a filter of 1 mm. of aluminium. Six doses of 1/6 β are given, either daily or spread over a fortnight, as the severity of the case demands. For various reasons there is a danger of sterilising patients, but that this cannot be easily guarded against in women seems to me without foundation.

Other electrotherapeutic measures have been used in the treatment of pruritus. Dr. J. M. H. MacLeod speaks well of zinc ionisation, and both here and in the United States of America it is our personal experience that static electricity has been used with considerable advantage. It is applied by means of vaginal or rectal glass vacuum tubes which are energised from the static machine. Its application is sometimes immediately effectual, often giving an instantaneous relief from the itching. The smallest size tube should be used at first, and the larger ones gradually substituted in succeeding treatments. It may be that the mechanical stretching of the anal area is of service. Dr. Agnes Savill devised a specially shaped tube, large enough to fit over the entire vulvæ. It is specially indicated when there is much swelling. It is pressed upon the swollen part and held in close contact. The treatment should be repeated daily. Both the vacuum tube for external use and the vaginal or rectal tubes for internal application, already mentioned, can be energised by the more familiar high-frequency machine and the results obtained may be equally good; but a careful

[2] THE LANCET, 1924, ii., 923.

comparison will show that the current is infinitely more agreeable to the patient when derived from the static machine.

The list of remedies to be used with advantage in the treatment of pruritus is by no means exhausted, as can be believed when its manifold causation is recalled. There are many therapeutic measures of which we have no personal knowledge, such as the destruction of the nerves at the point of their entry into the skin, and the injections of alcohol as described by Dr. Harvey B. Stone. The thickened peri-anal skin has been thinned by various applications, such as pure carbolic acid, solid CO_2, and even, under general anæsthesia, by the actual cautery.

Doubtless many remedies have been tried of which we have never heard, but the measures outlined, which we have actual experience of, if carefully applied and if painstaking choice is made between them, used separately or in combination will usually in the end achieve success.

ABDOMINAL TORSION OF OMENTUM.

By Michael J. Smyth, M.Ch. N.U.I., F.R.C.S. Eng.

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The seven cases recorded below are examples of a rare variety of torsion of the great omentum—sometimes referred to as a true or pure intra-abdominal torsion. Five of the cases have been taken from the post-war records of the London Hospital. A sixth has been kindly supplied by Mr. C. J. MacAuley, of Dublin, who has already reported a case, while the seventh was operated upon by the writer at North Middlesex Hospital, Edmonton. Four of the cases answer to the common conception of torsion of omentum, inasmuch as the whole or a large portion of the structure was involved in each. In the other cases small or isolated portions only were affected, yet symptoms were severe enough to determine operative treatment. For this reason, apart from the rarity of the condition, it was thought advisable to include all the cases in this series.

As surgical text-books in the main do not distinguish between the different varieties of the condition, I shall consider briefly what classification has been arrived at, and what exactly is meant by pure intra-abdominal torsion.

Hernial Variety.—The great majority of cases of torsion of omentum occur in association with right-sided inguinal hernia. Other varieties of hernia, including ventral and umbilical herniæ which so often accommodate omentum, rarely figure as complicating factors. In the hernial variety torsion may affect the intrasaccular, the intra-abdominal, or both portions of the omentum. If a hernia be present and the twisted omentum shows no direct communication with the sac, the hernia is nevertheless suspect, and the case is ruled out of the category of pure intra-abdominal cases.

Abdominal Variety.—If torsion occurs and no hernia be present the condition is known as "true or pure intra-abdominal torsion." Such cases may, however, be complicated by intra-abdominal lesions such as appendicitis, pyosalpinx, and ovarian cysts, or they may arise without any apparent complication. The term "pure intra-abdominal torsion" would be better reserved for those which show no intra-abdominal complications whatever. With this slight modification, Cowell's classification would read: 1. Hernial—(*a*) intrasaccular, (*b*) intra-abdominal, (*c*) combine 2. Abdominal—(*a*) pure intra-abdominal, (*b*) associat with disease of abdominal or pelvic organs.

Abdominal torsion of omentum is undoubtedly rare lesion, but not so rare as was formerly suppos Before Cowell's review of the subject—a revi covering the period 1882–1924—not more than 1 cases had been recorded, and of these only three we contributed by British surgeons. His excellent pap has evidently borne fruit, for in the five years sin it appeared almost as many cases again have be added to the literature, a majority now coming fr British surgeons. MacAuley has had the uniq experience of dealing with three cases, in one of whic however, a hernia was present, while Wakeley recor two typical cases which came under his care.

There is hardly a case on record where diagno has been successfully made, yet the majority of ca have been recorded by surgeons of great experien The condition is most apt to be mistaken for acu appendicitis, acute cholecystitis, and sometimes ev for acute perforation of a peptic ulcer. Absolu accuracy in diagnosis is not of paramount importan provided, of course, that operative and not conserv tive treatment is adopted.

Pathology.

The strangulated mass varies in size. The wh of the omentum may undergo torsion, but the pa most frequently affected is the right side. Sometim an isolated tag or a so-called accessory omentum all that is found to account for symptoms. T condition in which the mass is found depends on t time at which operative treatment is undertaken. the earlier stages it is more or less compact, a varies in colour from dark red to purple or bla Later on it may show signs of disintegration, wi perhaps the addition of local or diffuse peritoni probably as a result of infection from the bow The mass adheres to the neighbouring viscera a the parietal peritoneum, but so lightly that gen insinuation of the finger suffices for separation. Su delicate adhesions are to be distinguished from t permanent organised ones of past inflammato trouble or perhaps a previous laparotomy. The m is attached at its central or colic end by a pedi which has undergone rotation a number of tim varying from one to ten. The pedicle also varies size; usually it is about the thickness of a fing but if the twists can be undone it thins out consid ably, and transfixion is thereby facilitated. Th may, of course, be two pedicles, an adhesion formi the basis of the second. Blood-stained exudate the peritoneal cavity, the natural sequel to strangu tion of any abdominal organ, is present in all cas

MOVEMENTS OF THE OMENTUM.

The great omentum has long been known as t "abdominal policeman." This is a nice metaph but the probabilities are that the policeman is less policeman *in esse* than *in posse*. The omentum itself should be incapable of movement. Microscop ally there is no muscular tissue in its constituti except that in its blood-vessels. These are neith large nor numerous, and to expect them, as has be suggested, to exert a material influence on the positi of the omentum is to make too great a demand up a very small amount of muscular and elastic tiss Rather does it seem that its position at any time determined by forces outside itself, such as moveme

* Vick's interesting case (Brit. Med. Jour., 1911, i., 622) not included in this list.

the body in general, and in particular the action the muscles of the abdominal wall and of the aphragm, and the movements of the muscular scera and intestines to which it is attached or th which it comes into contact. A healthy omentum ould move on other healthy serous surfaces as ell-oiled wheels on one other, but if, by virtue of s dimensions and the forces which control its sition, it is brought in contact with the blemished rface of an inflamed organ it will offer the latter a otective attachment. Such attachment may velop into organised adhesion which, if slender or alk-like, will not interfere with the play of movement cessary for torsion, but may act the part of a second dicle. On the other hand, adhesions that are oad and firm or numerous will so seriously embarrass e omentum that rotation will probably be out of e question.

THEORIES OF TORSION.

Many theories have been advanced to explain dominal torsion of omentum. Payr's views are sed upon venous congestion and spiral twisting the veins around the arteries, the elastic tissue in e coats of the latter being then relied upon to aid bringing about the necessary rotation. Fagge, his Bradshaw lecture on axial rotation, points out at such a theory presupposes the presence of venous ngestion, a condition which is really the result d not the cause of torsion; and that in the case an organ which has undergone torsion both arteries d veins are alike twisted in the pedicle. Fagge's searches further show that arterial circulation tends, anything, to have a limiting and not an encouraging luence on the rotation of pedicles. It might be ded that if the theory of venous congestion did tain, then one would expect torsion of the testis cases of varicocele to be a commonplace of surgery. Other theories lay stress upon congenital malfor- ation of the omentum, inflammatory changes in its ucture, and increased intestinal peristalsis. It ay be that there is a congenital tendency to pedicle rmation. Prof. William Wright inclines to the view at the omentum is of the nature of an overgrown pendix epiploica, and states that if appendices piploicæ are carefully examined and stretched out the full extent of their structure it will be found at their free border is much longer than their rder of attachment. Looked upon in the light of overgrown appendix epiploica, or perhaps even aggregation of these structures, it is conceivable at the omentum might occasionally display a ngenital tendency to pedicle formation, but this at st is mere conjecture. Incidentally, appendices piploicæ themselves sometimes undergo torsion.

The view here taken is that before intestinal ristalsis or body movement can bring about torsion the omentum, some deviation from the normal ucture is necessary—a deviation tending to bring into line with other abdominal organs and tumours hich are liable to rotation. A normal healthy entum, spread apron-like across the viscera, should t readily lend itsef to torsion, but unevenness of ucture, a localised concentration of tissue to vide, as it were, the bulk whereon the forces that ng about torsion can have purchase, and pedicle rmation, are factors which will give the omentum whole or in part the semblance of a tumour hanging ely in the abdomen.

'That such a tumour should by mere alteration of the sition of the body, or by mobility imparted to it by a tault of the bowels, spin round and twist its pedicle, is as nprehensible as the fact that a good weathercock moves varying directions under the influence of the wind" (and-Sutton).

In this alteration in structure, inflammation with its consequent fibrosis and matting of tissue will no doubt play its part; and to this may be added the factor of adiposity, for the condition occurs most frequently in stout people. Pedicle formation may trace its origin to congenital tendencies, but the probabilities are that this is also a pathological change, the altered omentum dragging upon its attachment and fashioning a pedicle of its own. The writer has had the opportunity of examining only two specimens of torsion of the omentum; both were fat-laden and showed definite signs of chronic fibrous change and matting of structure. Evidence in favour of this theory was given recently by a patient with acute left-sided pain, who was found at operation to have torsion of the left border of the omentum; in the twisted mass were found two tumours which proved to be accessory spleens.

The same forces which bring about torsion in the case of a single pedicle produce torsion in double pedicles. Here the intervening mass of omentum is anchored to two comparatively fixed points, and is rotated on its longitudinal axis in much the same way as a handkerchief is swung around between the hands when held at opposite corners.

It does not necessarily mean that, torsion having once begun, the affected portion continues steadily in its rotation until all slack is taken up and there is a sudden and absolute obstruction to the blood-supply. There is reason to suppose from a study of the histories of recorded cases that the lesion is primarily recurrent or chronic, and that the acute manifestation of torsion is but the final stage in a condition which has been maturing for some time. That is, torsion is of gradual evolution; a twist now and a twist again, some pain no doubt being caused by partial obstruction to the blood-supply, but the severe pain of strangulation being deferred until thrombosis of the supplying vessels is absolute. Such, according to Moynihan, is what happens in the analogous conditions of torsion of the spleen and ovarian cysts.

"In neither does rotation of the pedicle take place suddenly. In cases of ovarian cyst the movements of the whole of a large and often adherent cyst is impossible. The acute change is not in the twisting of a pedicle, but in the thrombosis of vessels which have long been twisted."

Clinical Features.

The patient, male or female, usually stout and of about middle age, is seized with an attack of acute abdominal pain. There may be a history of previous attacks. The pain is moderately severe, though not generally so severe as that of acute appendicitis. It tends to increase in severity, is not relieved by homely remedies, and is made worse by purgatives, even though the bowels be well opened. As the right border of the omentum is the part most frequently involved, the pain is referred to the right iliac or right para-umbilical region, but it may be referred to the right hypochondrium, the epigastrium, or the left side of the abdomen, varying with the situation of the twisted part.

The patient does not look ill; in fact the general condition is not in keeping with the abdominal upset. There is slight fever, 99°–100° F.; the pulse-rate rarely exceeds 120, while it is usually below 100 and may be as low as 80. Tenderness and rigidity are manifest over the site of the twisted mass. Some patients exhibit a degree of tenderness altogether out of proportion to the underlying lesion. This is in all probability due to involvement of the anterior parietal peritoneum, which shows inflammatory reaction at the site of adhesion. In torsion of the whole or a large portion of the omentum, rigidity

may be widespread, but this is unusual. The mass may be palpable if of sufficient proportions and if rigidity be not too marked. It is not firm to palpation, nor are its limits well defined. Some writers assert that a lateral mobility of the tumour can be demonstrated, but this statement must be received with reserve, for a mass of twisted omentum that is palpable will be at any rate adherent to the anterior abdominal wall.

Differential Diagnosis.

Acute Appendicitis. — The condition is most frequently mistaken for acute appendicitis. In typical cases of both there are, however, some features which may help to distinguish between them.

(1) While either lesion may occur at any age, acute appendicitis is more a disease of youth; torsion of omentum more a disease of middle age.

(2) Nausea and vomiting, if present, are said to precede the pain in omental torsion, whereas the reverse obtains in acute appendicitis.

(3) In acute appendicitis the pain is first referred to the umbilical region and later settles in the right iliac fossa, with a maximum degree of tenderness over McBurney's point; in torsion of omentum the pain is at all times referred to and maximum tenderness is present over the site of the twisted mass.

(4) In torsion the palpable tumour is present early, whereas in acute appendicitis time is required—two or three days—for its formation. The tumour in acute appendicitis is firm and circumscribed and is not mobile.

(5) Acute appendicitis, with or without abscess formation, is accompanied by constitutional disturbance in keeping with a toxic condition. The patient looks and feels ill, and the temperature and pulse are higher than in omental torsion.

A definite leucocytosis must not necessarily be taken as indicative of acute appendicitis. The great omentum is rich in white cells, and this content is markedly increased in acute inflammatory and traumatic conditions of the abdomen. This may or may not have a bearing upon the question, but the fact is that cases of omental torsion in which a blood-cell count has been done show a leucocytosis ranging from 12,000 to 18,000.

Acute Cholecystitis.—Pain and tenderness are definitely referred to the right hypochondriac region with catching of the breath. The pain in omental torsion does not radiate to the back or right shoulder. The temperature in acute cholecystitis rises to 101° F. or higher. As local rigidity disappears it may be possible to map out the enlarged and tender gall-bladder. Later there may be evidence of jaundice. A history of dyspepsia will also help.

Acute Perforation of a Peptic Ulcer.—The widespread rigidity exhibited by some cases of omental torsion, combined with the small degree of change in temperature and pulse-rate, may, if the case is seen soon after the onset of illness, lead to confusion with perforation of a peptic ulcer. Immediately after perforation the temperature drops to subnormal, and the pulse-rate may even be slower than normal for the individual, but when this initial stage has passed the temperature and pulse-rate rise steadily, the pulse becoming thready as time goes on. The onset of the illness in perforation is marked by agonising pain, the patient looks very ill, and with each succeeding hour his condition becomes more desperate. Under anæsthesia the mass in omental torsion will no doubt become palpable, for these are the cases in which the whole or a large portion of the omentum is involved. This was a point which enabled Wakeley to alter th diagnosis in his second case.

These are some of the points of guidance in typic cases, but abdominal cases, whatever their natur have a habit of not being typical, and the mai point at issue is whether operation is to be undertake or not. Needless exploration is, of course, to l deprecated, but conservative treatment demands least the exclusion of any serious abdominal lesio requiring operation. With urgent symptoms an symptoms which give rise to doubt, one is not infr quently driven to exploration. There is one dang in omental torsion, and that is, that while mistakin the case for one of acute appendicitis, conservati instead of operative treatment may be adopte There are some surgeons who defer operation in case of acute appendicitis once a certain time limit ha elapsed from the initiation of the attack, sometime too, in the event of finding what is adjudged to be a appendix abscess. In the hands of its distinguishe advocates this line of treatment has given cause f satisfaction, but it demands certainty in diagnosi and the benefits of hospital are not available to a A delay of a few days may not make a vital differen to an uncomplicated case of omental torsion, thoug the sooner operation is undertaken the better. W can, however, imagine the danger of delay in such case as No. 7. The strangulated omentum woul no doubt, have provided an excellent culture mediu for the organisms from the acutely inflamed appendi of which it was a complication.

Cases.

1. *Mr. W. S. Perrin's case*, a married female, aged was admitted to the London Hospital on Oct. 25th, 192 Three days before admission she had complained of sudd acute pain in the abdomen, chiefly in the umbilical a right lumbar regions; the pain had been intermittent a at first severe, but had eased off later. It was still prese on admission to hospital. There was nausea but no vom ing, and the bowels were very loose (four to five motio daily). She gave a history of many similar attacks duri the three previous years, but none were so bad as the prese one. In the attacks the patient could feel a lump to t right of her umbilicus, and she lay in bed for a week un the pain and lump subsided. The lump never complet disappeared, but between the attacks she felt quite w The pain had no relation to food nor was there ever any si of jaundice, and there was no trouble with micturitio There were no previous illnesses of any importance.

The temperature was 100·4° F., and the pulse-rate 1 The patient was a large obese woman. The tongue w slightly furred. The abdomen was greatly distended, a there was marked tenderness and rigidity to the right the umbilicus and in the right lumbar region. There was hyperæsthesia.

Operation.—The abdomen was opened by a right upp paramedian incision with retraction of the rectus outwa A large piece of twisted and strangulated omentum w found adherent to the transverse colon. The pedicle w ligatured and the mass removed. The peritoneum of t anterior abdominal wall was very much inflamed oppos the site of the strangulated omentum. The gall-bladd duodenum, and stomach appeared normal. Enlarged glan were felt in the portal fissure. The incision was prolong downwards and the appendix found after some difficul Appendicectomy was performed.

The after-progress of the case was satisfactory, and t patient was discharged from hospital on Nov. 10th, 192 I have seen this patient in the follow-through departme of the hospital. She has been very well since her dischar and says that the lump never completely disappeared un she had her operation.

Microscopic findings.—(1) Hæmorrhagic infarction omentum. (2) No active inflammation in slightly fibro hypertrophied appendix.

2. *Mr. James Sherren's case*, a married female, aged engaged in housework, was admitted to the London Hospi on Sept. 24th, 1923. Four weeks before she had had slight attack of pain in the upper abdomen, follow exertion. Three days before there had been recurre of a similar pain, which was, however, more severe, a doubled her up. The pain was situated just above

nbilicus and, though it eased off somewhat, it continued ıtil the time of her operation; it had no relation to food, ıd was relieved by resting in bed. There was no nausea ır vomiting. The bowels had been opened since the ginning of the attack, and there was no trouble with icturition. For 16 years the patient had suffered from tacks of pain coming on a few minutes after meals and sting for a few hours. This pain was quite distinct from e acute pain for which she was admitted to hospital. was situated much higher in the epigastrium "just below e breast bone," came on after each meal, and remained th her for two or three weeks with two to three months' ee intervals. It was not associated with vomiting, and she d never been jaundiced.

Examination.—The temperature was 98·8° F., and the lse-rate 96. She was a spare woman. There was a thick r on the tongue and fœtid breath. Tenderness and rigidity re marked in the epigastrium. A small tense swelling ıs palpable a little to the right and above the umbilicus.

Operation.—A right upper paramedian incision was made d a poorly-developed rectus drawn outwards. A dark emorrhagic mass, a little larger than a walnut, was found herent to the falciform ligament and to the anterior ıll of the stomach. This proved to be a portion of the eat omentum which had undergone torsion and was aling off a perforating ulcer of the stomach. The gall-adder appeared healthy. The appendix was long, fibrosed, ıd tacked down by numerous adhesions; it was removed. ıe twisted mass was separated from the great omentum d partial gastrectomy was then performed, the ulcer-aring area of the stomach being removed, together with e adherent portion of the strangulated omentum.

The patient was discharged well on Oct. 15th. Seen in e follow-through department six months ago she said she d had excellent health since her operation.

Microscopic report.—(1) Chronic progressive peptic ulcer stomach. (2) Fibrosis and muscular hypertrophy of pendix. (3) Hæmorrhagic necrosis of a portion of the ıentum adherent to a chronically inflamed falciform ament.

3. *Mr. Hugh Cairns's case*, a Hebrew male, aged 57, was mitted to the London Hospital on June 20th, 1925. On e day before admission he had a gradual onset of pain the right side of the abdomen. There had been no usea or vomiting. At 5 P.M. he had taken castor oil, d during the night supplemented this with Glauber's lts. The bowels were opened, but pain got worse. His mperature was 98° F., and his pulse-rate 94. He was nder and somewhat rigid in the right iliac fossa.

Operation.—The abdomen was opened by a muscle-litting incision in the right iliac fossa. The appendix ıs injected, distended, and somewhat œdematous-looking, th fibrinous flecks on the serosa. Appendicectomy was rformed. A tag of great omentum, the shape of its pedicle, ıs discovered hanging freely movable within the abdominal vity. The strangulated tag was ligated and removed. ıe patient did well and was discharged on July 2nd. e reported to the out-patient department on March 17th, 27, and was very well.

Microscopic findings.—(1) Subacute inflammation of pendix. (2) Congestion and hæmorrhage in omentum.

4. *Mr. Alan Perry's case*, a married female, aged 27, egnant three months, was admitted to the London spital on Sept. 12th, 1925. Three days before the tient had been seized with sudden acute pain in the right ıc fossa. Vomiting and diarrhœa had accompanied the set of pain. The vomiting ceased on the first day, and e diarrhœa on the second. There had been no appetite two days. There was no pain on micturition and no tory of previous attacks of pain. The patient did not k ill. Her temperature was 99·4° F., and her pulse-rate 3. Her tongue was furred. Tenderness, rigidity, and a np were present in the right iliac fossa, and very slight derness in the left iliac fossa.

Operation.—A right paramedian incision was made, and nplete torsion of omentum discovered (three turns). e pedicle was ligatured and the twisted omentum excised. Recovery was uneventful, and the patient was discharged convalescence Sept. 24th, 1925.

5. *Mr. Russell Howard's case*, a married female, aged 33, rsing a baby 5 months old, was admitted to the London spital on Feb. 1st, 1927. Three days before admission patient had complained of sudden pain to the right of e umbilicus, not very severe but constant. There had en no vomiting, and the bowels had been open each day ce the onset of illness. Micturition was normal, and she d never had a previous attack. She was a healthy-looking man. Her temperature was 99° F., and her pulse-rate 84. r tongue was furred, and her heart and lungs clear. tender palpable lump was present in the right hypo-ondrium. Graham's dye test showed no evidence of olecystitis.

Operation.—On Feb. 10th an upper right rectus incision was made. A hard brown lump, 1 by 1 by 1 in., was discovered adherent to the anterior abdominal wall and to the stomach. On withdrawing it from the abdomen it was found to be a portion of the omentum which had undergone torsion. A small clamp was put on the stomach end of the mass, its pedicle transfixed, and the mass removed. The raw surface on the stomach wall was peritonealised by fine catgut and the abdomen closed. The patient made a good recovery, and was discharged well on Feb. 26th. In reply to a request to come to the follow-through department of the hospital she wrote to say that she was very well and had had no further trouble since operation.

Microscopic diagnosis.—Chronic inflammation and areas of necrosis of adipose tissue in portion of omentum.

6. *Mr. C. J. MacAuley's case*, a youth, aged 18, was admitted to the Mater Misericordiæ Hospital as an urgent abdominal case on Feb. 17th, 1928. He stated that on the previous day he had been seized with a severe pain in the right iliac fossa. He had vomited once, and his bowels had not been opened since the onset of the pain.

He was a healthy-looking youth. His temperature was 99° F., and his pulse-rate 94. The abdomen was undistended. He referred the pain to the right iliac fossa, which area was extremely tender and rigid. It was noted that the right testis had failed to descend and that the right side of the scrotum was under-developed, but to this fact no particular significance was attached.

Operation.—A diagnosis of acute appendicitis was made and immediate operation carried out, the abdomen being opened by a right Battle's incision. When the peritoneum was opened some free fluid—slightly blood-stained—escaped. The parietal œdema which I had noted in previous cases was not here observed. On seeking for the appendix a large mass was felt and easily delivered into the wound. This proved to be a mass of twisted omentum, purplish in colour, with an abdominal testis attached to its lower end. The whole mass was removed without much difficulty, but in the course of manipulation the adhesion of the omentum to the testis, which I was most anxious to preserve, unfortunately gave way, spoiling what would otherwise have been an unique pathological specimen. The abdomen was closed in the usual manner. The patient made an uneventful recovery and was discharged from hospital on March 3rd, 1928. There was no hernia in this case.

7. *Author's case*, a male, aged 44, was admitted to the North Middlesex Hospital at 4 P.M. on August 25th, 1925. He had been awakened from his sleep in the early hours of that morning by acute abdominal pain. He had vomited, and taken some brandy. This had failed to give relief and had made him vomit again. The pain had been very severe, and felt mainly across the lower abdomen; later it had seemed to settle in his right side. He stated that he had suffered from abdominal pains from time to time, but never anything so severe as this—never severe enough to make him lie in bed. His bowels were regular and had been opened on the previous day.

He was a tall spare man, who looked ill. His temperature was 102·8° F., and his pulse-rate 128. The abdomen was slightly distended, and did not move well on respiration. Definite tenderness and rigidity were present in the right iliac fossa and right para-umbilical region. The hernial orifices were clear, and there was no history of rupture. On rectal examination there was slight tenderness on the right side of the pelvis. The lungs were clear and the heart sounds weak. A diagnosis of acute appendicitis was made.

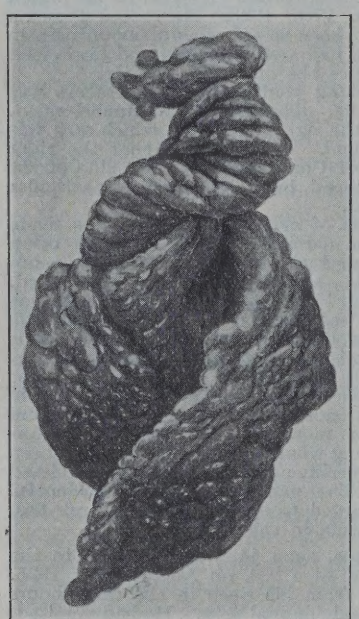
Under anæsthesia it was thought that a lump could be felt in the right iliac fossa, but this was so doubtful that I did not further consider it. The abdomen was opened by a muscle-splitting incision. The peritoneum looked dark and œdematous, and blood-stained fluid escaped on incising it. Immediately underneath lay the omentum, darkish-red in colour, adherent to the parietal peritoneum, the cæcum and the appendix. It separated easily from the parietes, and its adhesion to the cæcum and appendix was so light that when all three were delivered from the abdomen it had become almost completely detached from the other two. The appendix was swollen and acutely inflamed. For the moment it was covered with an abdominal pad and laid aside. On further withdrawing the omentum from the abdomen it was seen to have twisted upon itself several times. The twists were undone; as many as ten were counted, and even then the pedicle did not seem to be completely unrolled. The pedicle was ligatured and the twisted omentum removed. Appendicectomy was performed. Swabs on holders were passed down to the pouch of Douglas, and some odourless blood-stained fluid mopped out. The abdomen was closed without drainage. The appendix contained muco-pus and a large concretion; its mucous membrane was hæmorrhagic (see Figure).

The patient made an uneventful recovery, but remained in hospital six weeks for treatment of his cardiac condition.

A year later he met with a fatal accident, and Dr. A. W. Gregorson, assistant superintendent, North Middlesex Hospital, who performed the post-mortem examination, was kind enough to supply me with some details. "There was little trace of the great omentum except some vestiges near the splenic flexure. The cæcum was mobile and the peritoneum smooth at the site of operation. The liver was enlarged from the back pressure of a heart diseased in its valves and in its myocardium. Death was due to multiple fractures and a fracture of the base of the skull."

Treatment.

The treatment is removal of the twisted omentum at the earliest opportunity. No special difficulty attaches to the operation, and there is no recorded mortality in cases that have been operated upon early. It is on record that the twists have been undone and the omentum replaced, but such treatment is not to be advocated. If the strangulated part be viable the danger of recurrence is too great to be risked, as evidenced by the marked tendency of the omentum, even after removal, to resume its original twisted position. (See accompanying Figure.)



Author's case. Drawing of specimen made by Mr. W. T Shiels. Actual specimen measured 14 × 9·4 × 3·5 cm.

The main features of the case may not, in spite of careful consideration, lead to correct diagnosis, but they should at any rate determine that an exploratory operation be undertaken. A paramedian incision, with displacement of the rectus muscle outwards, is on the whole the best, for it allows of easy extension upwards or downwards, gives access to the majority of abdominal viscera, and rarely gives rise to subsequent weakness of the abdominal wall. It is an incision to be more strongly recommended than the pararectal, with displacement of the muscle inwards, for while the latter as a rule gives good access to the appendix it is not without its disadvantages. In the event of its extensive enlargement upwards or downwards, nerves get in the way and, even if recognised, may be damaged, with consequent weakness of the rectus or, in some cases, ventral hernia (Sherren).

There is strong evidence in favour of a recurrent or chronic condition of torsion of the omentum. If exploratory laparotomy be done to clear up recurrent attacks of vague abdominal pain, suspicion may not unnaturally be directed to the appendix, particularly if operation be carried out during a quiescent interval. The omentum should not be forgotten in the routine examination of the viscera, and any suspicious abnormality affecting it should be dealt with. Timely intervention will anticipate the possibility of acute torsion, and help much more towards the relief of pain in such cases than simple removal of a doubtful appendix.

I am indebted to the surgeons of the London Hospital; to Mr. C. J. MacAuley, surgeon, Mater Misericordiæ Hospital, Dublin; and to Mr. Spencer Mort, medical superintendent North Middlesex Hospital, for permission to publish the cases.

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BENZYL-CINNAMATE TREATMENT O PULMONARY TUBERCULOSIS.

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THE remarkable radiological improvement th has been noticed is the main reason for the followi account of the treatment of cases of pulmona tuberculosis with benzyl-cinnamate injections.

Method of Treatment.

Benzyl cinnamate ($C_9H_7O_2C_7H_7$ ($C_6H_5CH.C$ $COOCH_2C_6H_5$)), a natural constitutent of balsa peruvianum, is given by us as a 1 per cent. soluti in olive oil. We inject 5 c.cm. intramuscularly the usual site—namely, about 2 inches to 3 inch below the iliac crest—commencing laterally a giving successive injections slightly nearer the midd line. Injections are given daily for 12 days, follow by a fortnight's intermission, then 12 more dai injections, another fortnight's rest, and 12 mo injections. Then after an intermission of about s weeks the three series of 12 injections are repeate A rest from treatment of about three months followed by a further six series or courses injections exactly as the first six. The following the method of preparing the solution carried out b Mr. Rea, dispenser at the Chest Hospital.

Owing to the volatile nature of benzyl cinnamate it necessary to sterilise the olive oil before the medicament dissolved in it. This is done by heating 50 c.cm. of the in 100 c.cm. flasks at a temperature of from 120° C. 130° C. in a dry air steriliser for two hours. The necks the flasks should be plugged with a wad of sterile w wrapped in gauze. It is taken for granted that the ben cinnamate itself is sterile. It is solid at normal temperatur but may be readily liquefied by immersing the container a water-bath. The requisite amount is then weighed in

sterile measuring flask, and a sufficient quantity of the ɔoled olive oil added to make a 1 per cent. solution. Finally ıe solution is filled into 5 c.cm. sterile ampoules by means f a 20 c.cm. serum syringe.

The Table shows the result of the treatment in 3 cases. We have since added further subjects to

ase.	Courses of injections.*	Duration of phthisis in years before treatment commenced.	Result of treatment.		
			General condition.	Weight in lb.	X ray report.
1	7	7	Imp. ++	Same.	Very marked imp.
2	5	10/12	Imp. ++	+ 14	Marked imp.
3	3	6/12	Imp. ±	+ 4	Imp. l. lung; r. lung unch.
4	1	4/12	Died.	—	—
5	6	1	Imp.	Same.	Much imp.
6	6	5	Imp.	− 4	Definite imp. but suspicion of new cavity.
7	3	3	Imp. ±	Same.	Slight imp.
8	1	1	Died.	—	—
9	1	2	Died.	—	—
0	1	2/12	Died.	—	—
1	3	2¼	Imp. ++	+ 5	Very much imp.
2	1	1	Imp. ++	+ 8	One radiogram only.
3	6	3/12	Imp. ++	+ 42	Very marked imp.
4	3	11/12	Imp. ±	+ 14	One radiogram only.
5	2	10	Died.	—	—
6	3	1	Imp. ++	+ 29	No change.

* One course = 12 injections.
The duration of phthisis is estimated from the history of the te of onset of typical symptoms. Imp. = improved or provement. Unch. = Unchanged.

ır list but have not yet had time to assess their ogress. The treatment has been carried out under e not ideal conditions of a hospital in the centre of large city. The method appears safe, practically ıinless, easy, and cheap. It is not advisable to give is treatment in renal cases; in one patient recently e renal condition became worse after the injections. ecause the treatment was stopped the case has not ɔen included in the results.

Results.

Almost all the in-patients at this hospital, with the ɔception of those sent in for diagnosis, have advanced ıthisis, and all the cases dealt with in this article, th one exception, were in this category. The ɔception, No. 12, was attending a clinic with a rly quiescent type of phthisis when she developed large pleural effusion. She was immediately pirated on admission, and improved rapidly, the provement continuing on the benzyl-cinnamate ɜatment.

Five patients died. Four of these, Nos. 4, 8, 9, and , were so ill on admission that their death was a ıtter of early expectation. None of them had more an one course of injections—i.e., 12—and in two ɜes they were so ill that they could not be moved the X ray room. The fifth case (No. 15) was of ı years' duration, was complicated by gall-stones, d was mentally unsatisfactory. He had only two ırses of injections. It may be assumed that with ne of the patients who died was it possible to give air trial to the benzyl-cinnamate treatment.

The remainder of the cases (and all cases were ɔsen completely at random) showed evidence of ɑsiderable benefit from the injections. Cases 2, 5, 11, and 13 showed marked radiological improve- ɔnt. Cases 3 and 6 showed definite X ray evidence some improvement. Case 7 showed slight improve- ɔnt. Case 16, in the 13 weeks she has been in spital, has not yet shown X ray evidence of change, t has put on 29 lb. in weight. Case 1, with a tory of four years' active phthisis, was extremely ill, and has shown remarkable clinical improvement. She has been able to leave the hospital, and is now continuing treatment as an out-patient. Cases 2, 13, and 16 have also shown remarkable clinical improvement. Cases 3, 5, 6, 11, 12, and 14 have also improved clinically, but to a lesser extent. In Case 7 clinical improvement is doubtful. Cases 2, 3, 12, 13, 14, and 16 have increased in weight, most noticeably 2, 13, and 16.

The amount of sputum generally showed an increase at the commencement of treatment, with a subsequent decrease. No consistent effect was noticed during the treatment of these cases on the presence of tubercle bacilli in the sputum or on the temperature or blood pressure. It will be seen: (1) That usually at least three courses of injections were given before any definite improvement resulted. (2) That increase of weight has occurred principally in those cases of no longer duration than 12 months. (3) That definite clinical and very remarkable radiological improvement can be accomplished, even in very toxic and extensive and long-standing phthisis, such as we have had to deal with.

Our thanks are due to Mr. J. H. Mather, the hon. radiologist, for the valuable help he has given us.

A STUDY OF YEASTS

BY THE COMPLEMENT-FIXATION TEST.

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Between 1928 and 1930 a combined investigation was carried out at St. Bartholomew's Hospital, under the Rose Research Fund, with a view to obtaining evidence bearing upon the ætiology of lymphadenoma. In the course of this study an attempt was made to ascertain whether a mycotic infection is present in this disease, and a special search was made for the presence of micro-organisms of the yeast and sporothrix groups, by making cultures on Sabouraud's medium of affected glands and other tissues. As is well known, yeasts and yeast-like organisms occur on various vegetables in nature, are met with in air, and grow very readily on Sabouraud's medium. Differentiation is at present achieved principally by study of the cultural, morphological, and biochemical characters, with a result far from convincing. An attempt has accordingly been made to apply serology for this purpose, employing the complement-fixation test.

Previous attempts have been made to investigate the serological behavour of different strains of yeasts, but no practical method of classification appears to have resulted. Schütze,[1] in 1903, was unable to distinguish by agglutination and precipitin reactions the yeasts he investigated—certain yeasts employed for fermentation, and yeasts from corn and potato. He succeeded[2] in 1911 in differentiating the same organisms by the complement-fixation reaction. Lichtenstein,[3] in 1914, found that he could distinguish various kinds of saccharomyces and differentiate the torula group from the saccharomyces group by means of agglutination. Balls,[4] in 1925, found the precipitin method well adapted for use in differentiating between closely related species of yeasts and in showing relationships which are not brought out in the ordinary botanical classification. For the precipitin reactions in these investigations a yeast autolysate was used as antigen.

Mueller and Tomcsik [5] showed that extracts of many species of bacteria, prepared in such a way as to be as free as possible from coagulable proteins, contain substances which specifically precipitate with homologous immune sera and which produce skin reactions of the tuberculin type in infected animals, but do not induce antibody formation on repeated administration to rabbits. In 1914 they found that a similar "residue antigen" can be prepared from yeasts. The active material is a complex carbohydrate —"the yeast gum." Tomcsik,[6] in 1930, investigated the specificity of reactions obtained with this yeast gum. He studied 13 yeasts, 3 isolated from throat secretions from cases thought to be diphtheria, and 10 of the saccharomyces group. By cross-precipitation test five saccharomyces strains were apparently identical, whereas the remaining five were distinct. The results of complement-fixation tests were practically identical with those of the precipitin tests. Further, it was found that the results of agglutination tests, using suspensions of the yeast cells, were identical with those obtained by precipitin and complement-fixation tests using the yeast gum.

TECHNIQUE OF PRESENT INVESTIGATION.

1. *Preparation of sera.*—The sera used were prepared by Dr. Mervyn Gordon as follows: a full growth of the yeast on one slope of Sabouraud maltose agar was suspended in 10 c.cm. of saline and heated at 65° C. for 30 minutes, and 0·5 per cent. of phenol was added. Rabbits were injected with rising amounts of this suspension at weekly intervals for five weeks. Samples of serum were taken before each injection and compared. It was usually found that the best serum was obtained after four or five doses. With some yeasts a low titre serum only is obtained by this method; in these cases injections of the living organism may be successful.

2. *Complement-fixation technique.*—A quantitative test was used throughout, for only in this way can group fixation be detected; this was realised by determining the highest serum dilution at which the reaction was obtained. The technical details described in the *British Journal of Experimental Pathology* (1923, iv., 318) have been followed with minor differences of detail. In the early stages of the work the antigen used was a simple saline suspension of the organism. Experiments, however, showed that a saline washing of the yeast gave as strong reactions as the saline suspension, and that much sharper end-points were obtained. The work to be recorded was therefore carried out with antigens prepared in this way: the growth on one slope of Sabouraud maltose agar (age variable) was suspended in 10 c.cm. of saline; the suspension was allowed to stand for about five minutes, then centrifuged at high speed. The resulting clear supernatant fluid was pipetted off and used.

3. *Absorption tests.*—A suitable saline dilution of the serum to be absorbed was treated with a strong suspension of the yeast and the mixture incubated in the 37° water-bath for two hours. After centrifugation at high speed for one hour the upper layers of the supernatant fluid were removed and tested by the usual technique. It was found that absorption tests presented considerable technical difficulties, and so far they have proved satisfactory with thrush serum only. They could not, therefore, be used as a routine.

RESULTS.

1. *Identity of different strains of thrush.*—Cultures of the thrush fungus (*Oidium albicans*) were isolated from the throats of ten successive cases of the disease, and tested with a serum prepared against one of these strains. All specimens gave identical results, reacting to titre with this serum. The type of yeast most frequently obtained from lymphadenoma material, Type I., gave considerable group fixation with anti-thrush serum. The reaction was constantly found to be to half the titre of the homologous reaction. It was, therefore, important to show whether or not these organisms are distinct serologically by absorption of complement-fixing antibodies. Table I. records the results of such an absorption test. It will be seen that the thrush organism almost completely removes the antibodies from the thrush serum; absorption with the Type I. yeast produces a slig diminution only in this reaction. This result has be obtained repeatedly with another thrush serum.

None of the yeasts from lymphadenoma materi (with the sole exception of an organism obtained l culture of a pharyngeal swab from one patien from control material, or from the air, and none the specimens from the National Collection of Ty Cultures reacted to titre with thrush serum.

TABLE I.

Antigen.	No serum.	*Thrush serum unabsorbed.*				
Nil ..	—	—	—	—	—	—
Thrush ..	A.C.	++ 25	++ 50	++ 100	+ 200	— 400
		Thrush serum absorbed by thrush.				
Nil ..	—	—	—	—	—	—
Thrush ..	A.C.	+— 25	— 50	— 100	— 200	— 400
		Thrush serum absorbed by yeast, Type				
Nil ..	—	—	—	—	—	—
Thrush ..	A.C.	++ 25	++ 50	++ 100	— 200	— 400

++ = Complete fixation. + = More than 50 per ce fixation. +— = Less than 50 per cent. fixation. — = fixation. A.C. = Antigen control.

Many yeasts gave little or no reaction with thru serum and, with the exception of Type I., none ga more than a moderate group reaction. A simp complement-fixation test is therefore sufficient differentiate thrush from all the yeasts we have studie with the exception of Type I. This is readi distinguishable by an absorption test.

2. *Seven serological types so far determined.*—The yeasts studied have been obtained from lymp adenoma material, control material, and from the ai in addition, the following known pathogenic yeas and yeast-like organisms have been studie (1) thrush; (2) eight specimens of pathogenic yeas from the National Collection of Type Cultures; (3) t sporothrices of Beurmann, Schenck, Gougerot, a Jeanseln. When submitted to the complemer fixation test the following organisms were found to serologically distinct: (I.) Darbyshire: yeast fro lymphadenoma gland; (II.) Thrush; (III.) Toru Stoddart: No. 5 from the National Collection Type Cultures; (IV.) Skipp, A.: a *black yeast* fro lymphadenoma gland; (V.) Barber: yeast fro lymphadenoma gland; (VI.) Rowe: yeast fro lymphadenoma gland; (VII.) Beurmann's sporothri

Table II. shows the results of cross tests with the seven organisms and the corresponding sera. Tl titre of the reaction with the homologous organism given and a definite group reaction is indicate 0 = little or no reaction.

With but three exceptions, which remain for tl present unclassified, all the yeasts studied (58, includi 10 strains of thrush) fall into one or other of the seven groups, reacting to titre with one or other of tl seven sera.

Twenty-one lymphadenoma yeasts fall into fi groups—namely, I., III., IV., V., and VI., 12 them belonging to Type I. Twenty-four of t yeasts studied belong to this type, which contai three yeasts from the National Collection, several fro cultures of control material, and two obtained from t air. In the group of *black yeasts* (Type IV.) are tv organisms isolated from lymphadenoma tissu Six black yeasts were tested and all were found to identical. They include a yeast obtained from

vocain bottle, and the sporothrices of Gougerot d Jeanseln. Type III. (Torula Stoddart) contains no asts obtained from control material. It is composed two lymphadenoma yeasts and five other specimens pathogenic yeasts from the National Collection of

TABLE II.

	Serum—						
	I.	II.	III.	IV.	V.	VI.	VII.
I.	Titre 400	Group.	0	Slight group.	0	0	0
I.	Group.	Titre 400	0	0	0	0	0
I.	0	0	Titre 200	0	Group.	0	0
7.	0	Group.	Group.	Titre 1600	0	0	0
7.	0	0	Slight group.	0	Titre 800	0	0
I.	0	Slight group.	,,	0	0	Titre 1600	0
I.	0	0	,,	0	0	0	Titre 200

Darbyshire; II., Thrush; III., Stoddart; IV., Skipp. A.; V., Barber; VI., Rowe; VII., Beurmann.

pe Cultures. Type V. is that of a yeast isolated from case of lymphadenoma, which has proved to have thogenic properties of considerable interest. Two ner lymphadenoma yeasts and two specimens from ntrol material belong to this group. Type VI. nsists of two specimens only, both obtained from nphadenoma cases.

3. *The sporothrices of Beurmann and Schenck.*— yeast was found to react with an antiserum to the sporothrix of Beurmann; this organism is therefore quite distinct from members of the yeast group so far studied. It is worthy of note that by the complement-fixation test the sporothrix of Schenck is indistinguishable from that of Beurmann.

CONCLUSIONS.

1. By using a saline washing of the yeast as antigen the complement-fixation test can be applied in the identification of various members of the yeast and sporothrix groups. (2) Specimens of thrush (*Oidium albicans*), obtained from ten successive cases, gave identical results. By the complement-fixation test all belong to one serological type. (3) Specimens of yeasts obtained from other sources have been studied, and are shown to fall into five types. (4) The sporothrices of Beurmann and Schenck appear to be identical, and quite distinct from yeasts so far studied. The sporothrices of Gougerot and Jeanseln appear to be identical with black yeasts obtained from other sources.

The work was carried out under the direction of Dr. Mervyn Gordon. My thanks are due to him for permission to publish the results, and to his laboratory assistant, Mr. J. Haegerty, for invaluable practical help.

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CLINICAL AND LABORATORY NOTES

SEVERE DIPHTHERIA.

AN ACCESSORY METHOD OF TREATMENT.

BY B. A. PETERS, M.D. CAMB.,

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THE accessory method of treating diphtheria which here outlined has been tried on 730 cases during severe epidemic with encouraging results, the ath-rate being only 2·3 per cent., exactly half that the immediately preceding 600 cases. It is based the theory that diphtheria toxin (like other true ins) acts as a positively-charged colloid, causing culation or gelation of the blood and tissue teins, and that the pathology of the disease is, at st in part, explicable by the collection of these cules in the capillaries of important viscera. We nk we have confirmed this theory by the dark und examination of capillary serum in severe es. Antitoxin only neutralises toxin; it does not tore the floccules to their normal state of disper- n and electrical charge. The use of peptising nts (as suggested by McDonagh's work) would be easonable method of overcoming this.

n severe cases in addition to the administration of full es (30,000 to 40,000 units) of antitoxin, of which part is en intravenously, 5 to 7 ounces of 20 per cent. glucose ution is given intravenously on admission. This produces immediate improvement in the patient's condition. asionally a rigor may follow its use, but this never seems do harm. The patient is also given one or two doses of tramine (0·125 g.) intramuscularly on succeeding days. following mixture is given four-hourly by mouth until urine is alkaline to litmus: sod. bicarb., grs. 30; pot. arb., grs. 5; calcii carb., grs. 7½; aq. menth. pip. to one ounce. Four to eight grains of thyroid are given daily and 20 minims of tinctura lodi mitis by mouth in milk four-hourly. These two drugs are given until the urine is free of albumin; this sometimes takes three or four weeks, These drugs are extremely well borne, and no evidence of intoxication has shown itself, if the albuminuria is taken as a guide. If the patient is inclined to vomit in the second week the subcutaneous injection of a pint of 3·6 per cent. glucose will usually check it.

The treatment in our hands has undoubtedly saved a number of desperately ill patients, and appears to diminish the more deadly forms of paralysis. No fatal case of diaphragmatic paralysis has occurred in this series. The preceding 600 cases provided four such cases, although many of these received intravenous serum. The intravenous injections are sometimes difficult, and frequently need the exposure of a vein under 2 per cent. novocain. We are using two 20 c.cm. record syringes, which are filled and attached alternately to the needle in the vein. In the early stages of diphtheria the blood clots very rapidly in the damaged vein, so that the addition to the glucose of sodium citrate (grs. 5 to the ounce) is an advantage.

A NOTE ON SEPTIC CARRIERS.

BY LACHLAN GRANT, M.D., C.M., D.P.H. EDIN., F.R.F.P.S. GLASG.,

BACTERIOLOGIST, DISTRICT COMMITTEES ARGYLL COUNTY COUNCIL, CONSULTING MEDICAL OFFICER, BRITISH ALUMINIUM COMPANY, KINLOCHLEVEN.

A COMMON group of diseases with which medical practitioners have to deal is that of boils and local inflammatory and pustular skin infections, which occur more particularly on the fingers, hands, wrists,

forearms, back of the neck, and other skin areas, and at the nasal orifices. In other papers [1] I have fully discussed the probability that some of these troublesome and painful local infections result from the daily use of the present type of toilet and wash-hand lavatory basins. Most people wash their hands and faces several times daily in stationary water contained in the common unsterilised basins. They deposit in this water and on the walls of the basin the dust and dirt particles from the skin surfaces, which carry minute harmless or harmful "bacterial passengers." By the usual bacteriological methods these latter can be shown to be present in the polluted basins. It is thus plain that by washing in such a concentrated, contaminated fluid-medium, any micro-organisms present are applied and reapplied, again and again, to the washed (?) surfaces of the parts usually supposed to be correctly and properly cleansed. The result is that they are, to a large extent, deposited on the towels during the wiping and drying process. All this is surely quite unhygienic and insanitary. After such washings it is little wonder, whenever we get a wound of the skin, an abrasion, or an epilated hair leaving an open follicle, that staphylococcal, streptococcal or other pathogenic organisms frequently enter the open and exposed injured surface. These may then set up the complete infective and inflammatory process. At any rate, one must admit there is every possibility of this happening.

RECURRING BOILS.

Recently instances have been noted where several members of the same family suffered at intervals from recurring boils, or a too-ready inflammation of even simple wounds sustained in the course of the day's work, and it naturally occurred to me to go more fully into the medical history. In several instances an obvious origin for these inflammatory repetitions was soon apparent.

In the case of two patients from the same household, both of whom suffered within the past three years from numerous boils, several wrist infections—one of a severe type with abscess formation necessitating incision, following a transverse wound of the wrist—I found that the mother had a long-standing, chronic and open varicose ulcer of the lower leg, about 2½ in. by 3½ in. in size. In another male case with persistent periodic boils, it was discovered that the mother had a large, chronic, septic leg sore. These two poor and middle-aged women informed me they were quite distressed at their sons' frequent loss of work and wages through boils and abscesses which developed, in spite of repeated morning saline laxatives, a common method of prevention in many families. They did not realise that their own unhealthy integumentary systems were the likely carriers and distributors of the virulent organisms which caused these periodical infections; cultures from the chronic ulcers gave the usual staphylococcal growths.

In the treatment of these cases prophylactic aseptic daily cleansing by every member of the family was advised, and special mention was made of downward flushings from an elevated water tap. With one patient, in whose house no gravitation water-supply was laid on, the difficulty was overcome by washing at a nearby water spout—a natural running tap. Clean towels and garments were also recommended and, subject to careful local and general attention, with the occasional exhibition of a polyvalent staphylococcal vaccine, the boils and inflammations were cured, and for the past year there have been no recurrences. Meanwhile, with the aid of prolonged rest for the mothers, the op ulcers have responded to suitable treatment. ought to be of interest to state that the men affec were outdoor manual workers, liable to abrasions a other surface injuries.

HAND-BASIN CONTAMINATION.

This note is published with the suggestion t when these suppurative inflammatory infecti persistently recur, and where there is no syste condition such as glycosuria or a chronic furuncu state and where, in spite of pure water cleansin success is not achieved, it might be helpful to m fuller and tactful inquiries in order to discover there is not some carrier or harbourer of sep conditions in the home. Similar casual inflammat attacks in families may also result from the prese of septic teeth, chronic sinusitis, tonsillar infectio otitic abscesses, leucorrhœal discharges and fur cular conditions generally. It is obvious that from patients suffering from such diseases m daily enter the wash-hand basins, contaminat them and rendering them bacteriologically uncle Against infection from such sources the only effect precaution is to avoid washing in the station fluid, and to use pure running water for all the d ablutions. This can be easily carried out by us a combined elevated hot and cold water tap wit spray or single medium-sized jet inlet. Such mod and improved water faucets have already been f described by the writer in previous articles.[2] Tov can always be boiled, but the sterilisation of ev wash-hand basin after each usage is an absol impossibility.

Hence the necessity for the raised flow as a sim preventive remedy for these and other lar avoidable organismal infections. By the downw flush the dust and dirt particles, harbouring pathogenic bacteria, are carried off direct to waste and soil pipe. In this way there is no reappl tion of any infected microscopic suspended mat This method is so obviously correct that it se almost incredible that such faucets are not insta forthwith in every home and institution where gr tation water is laid on. Instead, the old-fashio primitive and dangerous toilet and lavatory bas with their close-up taps, are being used and fit for washing in the stationary water. This, as alre pointed out, favours the direct application of aggressive bacteria present, not only to the h cleansed skin areas but to the naso-oral orifice well. These microbic organisms, being "consi ately" rubbed in during the cleansing proce tend to inoculate the system, and any wounds abrasions of its cutaneous surface, with the poss risk of subsequently setting up one of the acute chronic, local or general infectious diseases.

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GONORRHŒA IN THE FEMALE CHI

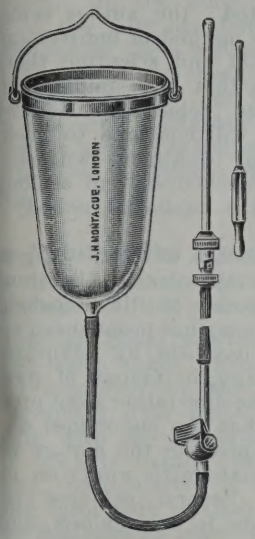
SOME POINTS IN TREATMENT.

By Harold G. Broadbridge, M.B., B.S. Lon
CLINICAL ASSISTANT, GENITO-URINARY DEPARTMENT, LONDON HOSPITAL.

In treating gonorrhœa in female children it difficult to obtain an even and thorough applica of a lotion or paint to the mucous membrane of

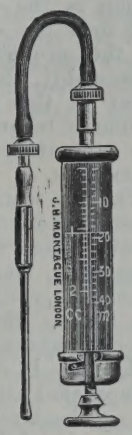
rethra and vagina, and I believe that quite a number f so-called relapses during treatment are due to ıadequate lavage of the mucosa with the antiseptic

FIG. 1.



Large cannula for vaginal douching. Small cannula for urethral irrigation.

FIG. 2.

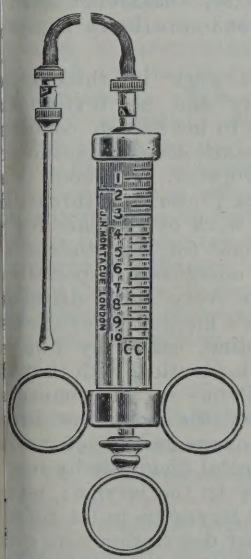


Urethral cannula and record syringe.

ı use. The cannulæ here illustrated were designed) facilitate thorough application of lotions, paints, nd the like to the child's urethra and vagina—articularly in gonococcal infections.

The urethral cannula is probe pointed at one end, while ıe other end receives a small nipple fitting. When in use 8 inches of narrow rubber tubing fitted with a male nipple connects the cannula with a stop-cock in the tubing of an ordinary irrigation jar (Fig. 1). The cannula is introduced into the urethra *with the lotion flowing*, and the stream is maintained while the cannula moves gently up and down the urethra. If it is desired to leave some of the lotion in the bladder to flush out the urethra when voided naturally later on (a method often used in adult women) it is only necessary to pass the cannula on into the bladder, the stream of lotion being continuous.

FIG. 3.



Vaginal cannula and syringe for pastes or viscid materials.

For paints such as solutions of silver nitrate a 1 c.cm. record syringe replaces the stop-cock in the rubber tubing (Fig. 2). In this case the unattached cannula is passed through the urethra until its probe point enters the bladder, as shown by the appearance of a few drops of urine at its other end. The cannula is then withdrawn into the urethra just sufficiently to prevent the escape of urine. The syringe, narrow tubing, and nipple are charged with the paint or application, and the nipple is attached to the annula, which is already in position. As the syringe is owly emptied the cannula is very gradually drawn along ıe urethra and out. The syringe must be filled with the arrow tubing attached, as otherwise the solution is simply xpelled into the empty rubber tubing and only air reaches ıe urethra.

The vaginal cannulæ are of two varieties: one with a ›ray nozzle for douching (Fig. 1), and the other with a ide-bore aperture for the introduction into the vaginal rnices of viscid materials—e.g., 2 per cent. flavine in ycerin (Fig. 3). This last cannula is connected with a 10 c.cm. syringe by narrow tubing fitted with nipples, the nipples in this case having bayonet catches.

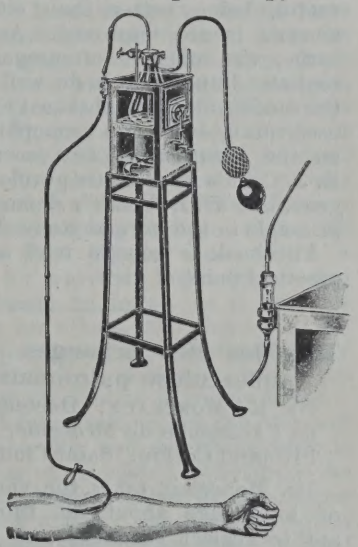
In using these instruments 8 inches of narrow tubing should intervene between the cannula and the supply of lotion. The introducing hand must rest firmly against the buttock. Should the child make any unexpected movement, cannula, narrow tubing, and hand of operator all move with the buttock, thus avoiding any risk of injury. The passage of these cannulæ into the urethra or vagina of a child causes little, if any, discomfort, and enables a complete antiseptic treatment to be given.

My thanks are due to Mr. Hugh Lett for allowing this work to be done in his department. The instruments are made by Mr. J. H. Montague, of 69, New Bond-street, London, W., and may be obtained singly or as a complete outfit.

NEW INVENTIONS

A PORTABLE THERMOSTAT FOR BLOOD TRANSFUSION.

THE apparatus here illustrated is on the principle of the Wassermann bath and its function is to keep the blood at the correct temperature throughout the operation of blood transfusion. The injection of blood at too low a temperature tends to produce pyrexial reaction and myocardial embarrassment, with undue post-transfusion sweating. Moreover, if the flask is immersed in a basin and kept warm by renewing the surrounding water, this operation becomes tiring to the nurses and inaccurate in its effects. The thermostat simplifies all this. The apparatus can be adjusted for any required temperature, but it is usual to work with it at 40–42° C. so as to allow a drop of 2° C. from the apparatus to the recipient. To summarise, the advantages are as follows. 1. One, if not two, assistants are dispensed with. The whole transfusion can be carried out unaided if necessary. In private work the apparatus is easily portable and invaluable. 2. The blood is guarded from disturbance. 3. It arrives at the patient at the right temperature constantly throughout the transfusion, however long. 4. Reactions become negligible, assuming that the cross test has been carried out properly; cardiac reactions are abolished, pyrexia is reduced to practically nil, whilst rigors become rare and of the mildest possible type, if present. For private work the oil burning type is recommended, but for institutional use the electric type is preferable.



The apparatus is supplied by Messrs. Charles Hearson and Co., of 27, Mortimer-street, London, W., and also by Messrs. Down Bros., St. Thomas's-street, London, S.E.

A. GEOFFREY SHERA, M.D., B.Chir.Camb.

REVIEWS AND NOTICES OF BOOKS

Liver in the Treatment of Pernicious and other Anæmias.

By S. C. DYKE, D.M. Oxf., M.R.C.P. Lond., Consulting Pathologist, The Royal Hospital, Wolverhampton. London: Jonathan Cape. 1930. Pp. 128. 5*s*.

THIS is a clear account of the liver treatment in blood diseases. After two concise chapters on the pathology of pernicious anæmia and the steps necessary for its diagnosis, a short history of the liver treatment is combined with a practical description of its details, including several recipes. In discussing liver extracts, the author points out that some of those on the market are useless, though others are potent. Other therapeutic agents such as hydrochloric acid and iron are discussed, and a preliminary transfusion is recommended for severe cases. Possible complications of the treatment are mentioned and the reticulocyte response is described. The methods suggested for an accurate reticulocyte count are somewhat cumbersome. Dr. Dyke clearly has no sympathy with the "toxic" theory of pernicious anæmia in any shape or form.

In secondary anæmia due to recurring hæmorrhage it is claimed that liver and iron together are definitely useful, being better than either alone. "Toxic" anæmia is not improved. According to Dr. Dyke sprue, the anæmia of pregnancy, and dibothriocephalus latus anæmia do well with liver; he quotes the successful results obtained by J. W. Pickering, who used this treatment in hæmophilia. The last chapter on the nature of the anti-anæmic principle describes E. J. Cohn's work on its purification so far as this has gone, and W. B. Castle's demonstration of the active principle in the normal stomach during digestion.

The book is easy to read and is written from a practical point of view.

Troubles des échanges nutritifs dans la tuberculose pulmonaire.

By R. MONCEAUX, Docteur-ès-Sciences, Lauréat de l'Académie de Médecine, Chef de Laboratoire à l'Hôpital Cochin. Saint-Cloud: Girault. Pp. 446.

Dr. Monceaux takes the view that in our pursuit of knowledge about the tubercle bacillus we are apt to neglect the study of the soil on which it grows. The 400 pages of his book are therefore devoted to an extensive study of metabolism as applied to tuberculosis, with little or no reference to the bacillus. Throughout the book the author chooses the physiological approach to the subject, and in many of his chapters gives an outline of the normal physiology of the organ under discussion.

The author divides the work into sections dealing with protein, fat, and carbohydrate metabolism, gaseous interchange and basal metabolism, the acid-base equilibrium of the blood, demineralisation and remineralisation, carotinæmia and liver function, whilst in the concluding sections he considers general questions of metabolism as they are affected by wasting in tuberculosis, by the results of open-air treatment, and by general hygiene. In the section on carotinæmia, a subject which is very little understood in relation to tuberculosis, or indeed to other diseases, Dr. Monceaux discusses the relation of the condition to cholesterinæmia and the failure of oxygenation. He does not give many quantitative analyses, but supplies adequate references. In the long section demineralisation and remineralisation many vie by many writers are quoted; the author sums by the statement that the method of indirect calc cation is the only rational and scientific thera but does not convince us that any simple soluti of the problem has been achieved. Meanwhi presumably, the clinician will continue to back fancy in the way of drug treatment without t serious a regard for the biochemist, and as long the laboratory findings are equivocal nobody c blame him.

The last section of the book is devoted to a gene consideration of the therapeutics of tuberculo viewed from the standpoint of the biochemi physician. Here Dr. Monceaux has pronounced viev which are contrary to those held by advocates the Gerson diet in Germany, in favour of pushi the carbohydrate side of the diet rather than prote and fats. It is a relief that the endocrines do r occupy that all-important place in the picture wh we are beginning to associate with works on me bolism in tuberculosis. Several coloured pla illustrate lesions of the liver in tuberculosis, and excellent bibliography is included; unfortunate no subject index is supplied. The book is full information, and in places both stimulating a provocative.

Diseases of the Nose, Throat, and Ear.

Medical and Surgical. Sixth edition. By WILLI LINCOLN BALLENGER, M.D., F.A.C.S., late Profes of Otology, Rhinology, and Laryngology, Univ sity of Illinois. Revised by HOWARD CHARI BALLENGER, M.D., F.A.C.S., Otolaryngologist the Evaston Hospital. London: Henry Kimpt 1930. Pp. 1138. 50*s*.

Prof. W. L. Ballenger's work in rhinology well known in this country and his text-book therefore of especial interest to his British colleag where it deals with the operations and methods treatment which he has elaborated. The book is of the larger works on the ear, nose, and throat, a is perhaps more useful as a work of reference for specialist than as a text-book for the student a general practitioner. The operations, especially rhinology and otology, are very fully discuss incidentally, Prof. Ballenger's method of enucleat the tonsils with the guillotine, called by him Ballenger-Sluder operation, is identical with that fi described by Whillis and Pybus in this country 1910. The weakest part of the book lies in description of the clinical appearances of vari diseases and in their differential diagnosis by insp tion. This applies especially to the larynx; no would recognise tuberculous laryngitis in its differ clinical aspects from the short description here giv and the single illustration gives a very poor idea the lesions usually found in this disease. The sa criticism applies even more forcibly to syphilis, this disease in the larynx is dismissed in just o one page and is not illustrated at all; altho syphilitic laryngitis is uncommon nowadays a kn ledge of the laryngoscopic appearances it present important in the differential diagnosis from ot affections. The much commoner syphilitic manife tions in the fauces are described very briefly in un two pages; all these affections are grouped un chronic granulomata of the nose, throat, and

one chapter in the section devoted to the nose and
cessory sinuses. Indeed, the larynx in general
ceives rather scanty notice, and the œsophagus even
ss, malignant disease of the gullet being discussed in
) lines. On the other hand, diseases of the ear
id of the nose are treated very thoroughly, the
erations on these regions being carefully described
id illustrated, and these sections of the book deserve
e highest praise. The proof-reading has not been
ry efficient; Krishaber's name is misspelt, a page
mastoidectomy is headed "simple thyroidectomy,"
id another on œdema of the uvula "edema of the
lva."

he Mind of the Savage.

By RAOUL ALLIER. Translated by FRED ROTHWELL
London: G. Bell and Sons, Ltd. Pp. 301. 15*s*.

MEDICAL men, administrators and missionaries
hose work takes them to those parts of the
orld inhabited by the simpler peoples ought to
e equipped with more than professional skill in
aling with the inhabitants of the country where
eir work is found. Some knowledge of anthro-
logy, particularly in its psychological aspects,
ould form part of their mental equipment. Prof.
lier has been for many years a student of primitive
e and mind, and attempts to supply in this book
e information necessary for appreciating the minds
savages or, as one ought to call them, simpler
oples. He follows very closely Levy Brühl and
e French school in the theory that there is a very
finite hiatus separating the civilised from the
vage. According to this school the savage mind is
e-eminently non-logical, or pre-logical; it takes
tle note of the law of contradiction and is little
le to remember new intellectual situations, although
possesses all the affective life and moral excellencies
ich civilised men have. Above all, the savage is
garded as overridden by magic, his life being
rrorised by the magical systems which hold his
nd in thrall. This conception is by no means
nerally accepted, and certainly English social
thropologists are not likely to endorse it. More-
er, in his very extensive studies of a subject calling
a knowledge of affective psychology, Prof. Allier
s entirely ignored Freud's work in general and his
rk on totem and taboo in particular. Roheim also
apparently unknown to him. Since these works do
empt to bridge the gap between savage and civilised
id neurotic), theories which take no account of
em are unsatisfying.

umeurs medullaires associées à un processus syringomyélique.

By Dr. N. JONESCO-SISESTI. From the Neurological Clinic of Prof. G. Guillain at the Salpêtrière. Paris: Masson et Cie. 1930. Pp. 295. Fr.45.

STUDENTS of neurology will welcome this fine
ntribution to our knowledge of a somewhat unusual
t well-recognised type of intramedullary tumour,
ich has its site almost always in the cervical or
rvicodorsal region. With this tumour is associated
secondary gliosis or gliomatosis extending up
d down the cord and, in its turn, exhibiting changes
ntical with those of syringomyelia as ordinarily
derstood. The monograph is based on five personal
ses, to which are added, for purposes of comparison,
e records of some 14 others obtained from the
erature. On the clinical side, sensory and motor
mptoms, irregular and asymmetrical, develop in
areas corresponding to cervicodorsal segments, the former leading the way in most instances, and exhibiting a syringomyelic dissociation during early stages. Later, large areas of sensory loss are manifested, and a spastic paraplegia below with atrophic palsies above. Lower cranial nerve symptoms are exceptionally rare, even though bulbar prolongation of the gliosis is found post mortem. Pathologically, the tumours belong to the class of fibroglioma or of ependymoglioma, with an occasional teratomatous formation; these are enveloped by gliomatous hyperplasia which proceeds to spread up and down, and in which syringomyelic cavities may subsequently appear. In the spinal fluid an "albumino-cytological dissociation" is usual. The author describes in some detail a case in which noteworthy clinical improvement followed radiotherapy.

The Spirit of Chemistry.

By ALEXANDER FINDLAY, Professor of Chemistry, University of Aberdeen. London: Longmans, Green and Co. 1930. Pp. 480. 10*s*. 6*d*.

THE quotation on the title page of this work defines the author's intention, which is to introduce chemistry to those who require instruction in the science as an element of general culture rather than as a part of their professional or technical training. The quotation runs: "It is not the particular facts of a science that constitute its vitality, but the generic facts or conceptions to which they have elevated the mind. Facts are the body of science, and the idea of those facts is its spirit." The words are those of Samuel Brown, a medical graduate of Edinburgh University, who failed to obtain the chair of chemistry in his alma mater because of certain strongly held but fallacious views, but whose literary works are well worth consulting to-day. Along the lines thus laid down Prof. Findlay has written a sound book and one for which an increasingly large number of readers should be found, as it becomes increasingly necessary for others than those who are destined for a scientific career to understand at any rate something of a branch of science on which the development of modern civilisation is largely based.

The introductory chapter, setting out the aim and methods of science generally, and describing what is termed the twilight age of chemistry, is not here the usual perfunctory introduction allied to the throat clearing of the nervous orator; the passages which refer us back to the classic learning are closely related to all that follows, and explain the brilliant theorising with which the subtle but practical Greeks sought to solve the riddle of the universe. In essential truths their teaching, or guessing, was right, and where it was wrong we see that the errors were largely due to lack of the material equipment possessed by the modern researcher. But their wisdom was hidden from the world throughout the dark ages, while what natural philosophy was manifest during mediævalism was perverted mischievously by mysticism. Especially is this true of the development of chemistry from alchemy. The critical move forward is attributed by Prof. Findlay to Robert Boyle, "the kindly, lovable, courteous, and humble-minded nobleman and man of science," whose life is coincident with the latter half of the seventeenth century. Boyle may be regarded as one of the founders of the Royal Society, for he was a member of the "Philosophical College," styled "invisible" because it had no home until it blossomed into "the Royal" under the patronage of Charles II. Boyle's "Sceptical Chymist" marked the

close of the alchemist's sway and the birth of chemistry proper.

The fundamental laws of that chemistry are so clearly expounded by Prof. Findlay that a sound conception of the science can be obtained by any educated person who reads these chapters closely, particularly if he has some elementary training in physics and is sufficiently industrious to work out the calculations for himself. Probably only at the expense of such interesting labour will the necessarily complicated terminology be easy of remembrance. An automatic familiarity with the fundamental precepts—the great general "laws," usually eponymous, of physics, chemistry, and electricity—is not easily obtained by those with whom its acquirement has not been part of an undergraduate's education. The terminology revolts such readers, who regard its novelty as an added difficulty to their studies, whereas technical terms are the price of exact thought.

The lessons to be drawn from an essay on the three states of matter—a most important section of the book—are brought into line with the latest views by chapters on radio-activity, atomic constitution, and the determination of the atomic weights. The chapters demand and will repay attentive reading, for as their facts and arguments are assimilated an understanding will be gained of the essential concepts of modern chemistry. The connexion appears between the work of Dalton and Mendeléef and Greek theorising, looking backwards, while, looking forwards, we see how the grand contribution from radiology confirms and infinitely expands the discoveries of earlier physicists and chemists. Thus scientific spirit will be created in the reader. Such a spirit is stimulated by the author's plan of writing, whereby the critical discoveries, which were followed by immediate progress, are placed in historical settings, portraits and biographical details being given of the protagonists. So the long story becomes continuous and absorbing.

Die Hypertoniekrankheiten.

Second edition. By Dr. ESKIL KYLIN, Director of a Department of the General Hospital, Jönköping. Berlin: Julius Springer. 1930. Pp. 270. M.22.

Dr. Kylin's main contribution to his subject is the distinction of two forms of hyperpiesis—namely, essential hypertension (hyperpiesia), which is determined by a primary disturbance of vasomotor control, and acute glomerulo-nephritis, which he visualises as primarily a disease of capillaries following and due to infection, and widely distributed throughout the whole body. Whereas essential hypertension is, in its initial stages at least, a functional disorder, and only later leads to structural change in the vessels, glomerulo-nephritis is at its first onset a widespread disease of capillaries to which arteriole spasm is secondary. In the former the capillary pressure is unchanged, whereas in the latter it is raised. The histological changes in the arterioles and capillaries in acute diffuse nephritis are described in long extracts from descriptive observations made by Huckel on two cases, in one of which death occurred 30 hours and in the other 2½ days after the onset of acute nephritis.

In support of his view that the disease is essentially an acute infection of capillaries all over the body, Dr. Kylin refers to cases under his own observation, and others reported in the literature, in which a rise of blood pressure occurs several days before there is any sign of nephritis on examination of the urine; he also speaks of cases in which, in addition to the rise of blood pressure, there is an increase of body-weight due to œdema with normal urine, and of the rathe doubtful cases of so-called acute nephritis, in which th whole course of the disease is run without albuminuria and finally he emphasises his standpoint by giving th name Capillaropathia acuta universalis to the diseas known as acute diffuse glomerulonephritis.

The introductory chapters on the physiology arterial and capillary blood pressure, the methods measuring these pressures, and their variations b day and during the passage of years, are well describe and the mechanism of hypertension is discussed i detail. The author is at pains to state the points o which he is in agreement or at variance with othe authors, and he particularly discusses the relation his views to those expressed by Prof. Volhard.

This monograph is written mainly from a theoretica point of view, and details of morbid anatomy an histology and of treatment of the diseases describe are somewhat slight. But it forms an interestin study of the relation of hyperpiesis to hyperpiesia acute and chronic nephritis, and chronic interstiti nephritis, and will be appreciated by those student of the subject who read German easily.

Les plexus choroïdes.

By Mme. Dr. NATHALIE ZAND. With a preface b Prof. Dr. G. ROUSSY. Paris: Masson et Ci 1930. Pp. 140. Fr.22.

Dr. Nathalie Zand's monograph on the choroi plexuses comes at the right time. Various theori of humoral-neural interaction, of neural infectio and defence, of nervous disease and nervous treatmen depend in part at least on the rôle played by meninge vascular endothelia; hence anatomical and physi logical prolegomena are indispensable. In th volume is succinctly set forth all that is known of thes subjects; the author summarises it in the significan conclusion (among others) that the cerebro-spina fluid is secreted by the choroid plexuses. She reject the view which considers the arachnoid a serou membrane of two layers, declaring for its unity; th epithelium over the plexuses, moreover, is held t differ morphologically and physiologically from tha of the ependymal cavities. In the connective tissu layers of the plexuses are arachnoid cells regarded b some as meningoblasts or meningocytes; Dr. Zan argues for their histiocytic nature, and assigns the to the reticulo-endothelial system with the functio of ensuring absolute protection for the nervou system from substances dissolved in the blood. Th latter third of the book deals at some length with th pathology of the plexuses, distinguishing acute an chronic lesions, and discussing changes in senility in psychosis, and in the more ordinary disease conditions of neurology.

A good bibliography is appended and there are number of illustrations, but the book lacks an inde

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SHEFFIELD ROYAL INFIRMARY.—A new casualt block at this hospital, which has cost £23,000, wa unofficially opened last week. The building includes dermatological department.

NEWCASTLE-ON-TYNE CITY MENTAL HOSPITAL.— Last year there was a steady increase in the number patients of both sexes, and on one day in December la there were 1002 on the books, the largest number on recor The annual report of Dr. H. D. MacPhail, the medic superintendent, states that, although the general health the patients was good, the number requiring continuou treatment in bed increased out of all proportion to the increas in the number of patients. Deaths numbered 71, a lo rate compared with those of the preceding five years. Th average daily number of patients was 996.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 13, 1930.

DIET AND GROWTH.

INTEREST in the best means of promoting the physical development of children was renewed in this country a few years ago by the investigations of H. C. CORRY MANN, who showed that an additional daily allowance of a pint of milk considerably increased the rate of growth of boys. By control experiments he showed that this enhanced rate of growth was not due to the correction of any absolute deficiency either in the total energy value of the diet or in the magnitude of its protein, carbohydrate, or fat content. The Scottish Board of Health later repeated the work and obtained very similar results; at the same time they observed that skim milk had almost the same stimulating effect on growth as whole milk. This observation apparently ruled out the possibility that the fat-soluble vitamins of milk might be concerned with the phenomenon, for skim milk has been proved to contain negligible quantities of these substances. It is possible to speculate concerning the nature of the factor or factors present in milk which bring about the increased rate of growth, and to suggest for instance that it may be the peculiar quality of the proteins, the mineral content, or some hitherto unrecognised water-soluble accessory factor; but no opinion about this can yet be expressed with confidence.

There is another method of investigation which might throw light on the nature of the common dietetic deficiency in childhood which can be corrected by a supplement of milk—namely, the method of statistical survey. Such a survey is reported by Dr. J. B. ORR and Miss M. L. CLARK in the present issue, and it is useful to compare its results with those they obtained by direct experimentation during their study of the effect of milk supplements on growth. The present survey consisted essentially of a careful record of the amount of food entering the homes of a series of Scottish families during the period of one week. Corrections were made to the figures thus obtained for probable wastage, and by the use of standard food tables it was then possible to gain some knowledge of the average total energy value and of the average quantity of protein, carbohydrate, fat, and mineral elements in the daily diet of the individuals concerned. The data thus collected indicated that according to recognised nutritional standards there was no widespread deficiency either in the total amount of food eaten or in the protein, carbohydrate, and fat contents of the diet. The mean daily consumption of calcium and phosphorus was above the figure put forward by H. C. SHERMAN as representing a safe allowance for maintenance, whereas that of iron was a little below SHERMAN'S corresponding figure. In so far as these diets are compared with accepted maintenance standards they appear to be adequate on the whole, though in some towns, and especially Dundee, a large percentage of the families investigated consumed less than the standard amounts both of protein and of mineral elements. It is commonly recognised, however, that the needs of growing children for individual foodstuffs may be greater than that of adults. When allowance is made for this fact in handling the data collected in this survey it seems probable that a significant proportion of the children whose diets were analysed were getting too little protein, calcium, phosphorus, and iron to permit of their optimum rate of growth. If this is true, at least a partial explanation of the stimulating effect of milk supplements on the growth of such children might be forthcoming, for milk is acknowledged to be a particularly valuable source of good protein and of calcium and phosphorus, though its iron content is insignificant. It may be remembered that CORRY MANN found little stimulating effect on growth as the result of giving protein derived from milk as a supplement to boys' ordinary diets. This observation does not necessarily rule out the possibility that a lack of good protein plays a part in the sub-optimal rate of growth of Scottish children. The proteins in the basal diets of the particular English boys studied might differ in growth-promoting capacity from those in the Scottish children's; moreover, the proteins of untreated fresh milk may be capable of stimulating growth more effectively than those obtained from milk by a precipitation process.

It is not claimed that this nutritional survey has afforded any new information on the chemical constitution of the diets best suited to promote growth in children. It does, however, tend to support the conclusions reached by CORRY MANN, and confirmed by the Scottish Board of Health, concerning the value of milk for growing children.

VISCERAL DECOMPRESSION.

Sir WILLIAM WHEELER in his address at Winnipeg on the significance of recoil following visceral decompression, an abstract of which appeared on p. 541 of our last issue, drew attention to a principle of the greatest importance to clinical medicine. Sudden increases in pressure, whether acting on the body as a whole or on any separate organ or system, are catastrophic in their results; if produced gradually they give rise to some of the most beautiful adaptations of which nature is capable; if maintained too long or increased unduly, adaptation fails and catastrophe follows, no less disastrous because it has been delayed. Conversely the sudden release of pressure of any degree may give rise to effects as unpleasant as those of pressure. It is seldom possible to relieve pressure as slowly as it has arisen, but Sir WILLIAM points to many instances where our methods of relief might be better graded with advantage to the patient. One of the most dramatic instances of the need for a gradual reduction of pressure,

which does not come within Sir WILLIAM'S survey, is that afforded by caisson disease; others are the tense bladder of urinary obstruction and the distended bowel in chronic intestinal obstruction. Sir WILLIAM shows how the principle to which he has drawn attention applies to regions as diverse as the bowel, the liver, the urinary system, the spinal cord, and the eye; and while he does not discuss in any detail its application in the field of pure medicine, there are many obvious instances of its importance. In these times when the outlook of the general clinician is apt to be obscured by a wealth of important but sometimes bewildering laboratory detail, it is well to have his attention directed to certain broad general principles of physiology or pathology; such a survey, too, cannot but help the specialist to adjust the perspective of his own subject.

While Sir WILLIAM WHEELER'S thesis is no new one, it has a particular value in his collection of instances of a pathological process acting in much the same way on whichever system or organ it affects, and in his insistence that treatment to be efficient must recognise the state which it aims to combat, and must be based on a general principle rather than on details of technique. Back-pressure, however produced, is one of the primary pathological states to which the body is subject, and whether it affects organs grossly or in more local degree, the principle still holds that the greater the tension the more gradual must be its relief. There can be little doubt that many of our present-day procedures for the relief of back-pressure are too rapid in their action and this is perhaps particularly true of operations for intestinal obstruction. The practice of emptying distended coils as rapidly as possible, by means of a tube passed along the bowel from an incision in it, is dangerous in direct proportion to its efficiency, and as Sir WILLIAM points out the cases of obstruction that do best are those in which a slow steady drain can be established through a small tube. Perhaps nowhere else is the danger so well seen as in pleural empyema, where the risks of acute pulmonary œdema or of flapping mediastinum have gradually taught the lesson of slow relief; in children especially, repeated slow aspiration is necessary before drainage if fatality is to be avoided. Instances of the importance of the effects of recoil following visceral decompression could be adduced whatever organ of the body is being considered, and we feel that Sir WILLIAM WHEELER is to be congratulated on having used his large clinical experience to illustrate a general principle of wide scope.

PHRENICOTOMY FOR PULMONARY TUBERCULOSIS.

IT might be an exaggeration to say that there is a stage in every case of pulmonary tuberculosis at which treatment by artificial pneumothorax would be curative, but it is certain at least that this treatment remains the method of choice for most cases diagnosed when the disease is still limited in area and confined to one lung. If complete deflation of the affected organ can be secured the is a reasonable prospect of cure. Treatment mus however, be commenced before adhesions ha formed over the affected area and at a time whe the lung is free to collapse. If the pleura is n free localised adhesions are drawn out as the lur retires from the chest wall. The resulting strin or bands maintain the patency of cavities whic continue to act as incubators for the tubero bacillus. Thus, though the unaffected portio of the lung, if well contracted, may be free fro further danger, the integrity of the opposite lur is constantly threatened. If the bands are suitab for division by electrical methods effective collap may still be maintained. If their extent or situatio renders this impracticable, two further method of treatment are available: the major operatio of thoracoplasty or the minor operation of phren exairesis. The former imposes a severe psych logical and physical strain, may be followed b acute suffering, and is not without risk to lif The latter, carried out under local anæsthesi exposes the patient to negligible risks and mak no demands on his fortitude of mind or physic resistance. Section of the phrenic nerve was fir proposed by E. STUERTZ, in 1911, for tuberculosis one lower lobe. Disappointing results were obtaine however, by those who first practised nerve sectio Accessory fibres, especially those arising from th fifth cervical nerve, provided collateral transmissio of impulses and consequently in many cases th hemi-diaphragmatic paralysis was only temporar In the modern operation an attempt is made t withdraw the whole nerve and if ten centimetr can be secured a permanent paralysis results.

The chronic fibroid type of pulmonary tube culosis common in middle life is seldom seen in i early stages. The middle-aged working man pay little attention to a cough which causes but sligh disability in the winter months and scarcel troubles him at all in the summer. It is only whe increasing lassitude, severity of cough, or hæmo rhage interfere with his working capacity that h begins to suspect anything more than bronchiti When at last he reaches th esanatorium, possibl half of one lung is densely fibrotic and excavate in its upper lobe, and though physical signs may b unilateral the radiogram will show very definit involvement of the opposite lung. Cases of thi type are unsuitable for artificial pneumothora treatment, and as a rule the patient has neithe time nor patience for it. Thoracoplasty is still les applicable. A period of residence in a sanatoriu teaches the patient how to take care of himself an how to avoid infecting others; there is some gain i weight, and cough and expectoration are lessene On his discharge to his home a relapse is almos inevitable and death ensues within a few year It is in cases of this type that phrenic avulsion ma give very good results. Dr. R. W. MATSON ha reported an excellent series,[1] and his article demand careful attention.

Dr. MATSON has obtained his best results in th proliferative or fibrotic type of disease. He consider

[1] Amer. Rev. of Tuberculosis, 1930, xxii., 1.

hat in this type the capacity for collapse of the liseased areas of the lung is greater than that of the naffected parts. Consequently, though the upper obe is usually mainly affected, reduction in volume f the hemithorax enables the collapse capacity f the diseased lobe to exert itself. It is this collapse f diseased tissue, and not diaphragmatic stasis, vhich achieves benefit. The results of operation ave been striking. Dr. MATSON quotes a series of 4 cases of the productive type of disease affecting he upper lobe. In each case artificial pneumo-horax had failed and thoracoplasty was contra-ndicated by the condition of the less affected ng. In 52 per cent. of the cases the improvement following operation justified the hope of ultimate recovery. Tubercle bacilli were abolished from the sputum and the patients were able to return to work. In 38 per cent. there was definite improvement, but little prospect of permanent arrest. Dr. MATSON adduces further evidence in support of the modern teaching that phrenic avulsion should always precede thoracoplasty. He quotes a series of 32 cases of unilateral disease in which thoracoplasty seemed indicated. After phrenicotomy the number was reduced to 21. At the Winnipeg discussion (reported on p. 603) Dr. W. L. MANN also insisted on phrenic avulsion as a preliminary to thoracoplasty.

ANNOTATIONS

DEATHS FROM DIPHTHERIA.

ARE we making the best use of our knowledge of iphtheria? The question arises on perusal of the nnual reports of medical officers of health, and it efinitely gets the answer "No." Patients are far o often moribund on admission to hospital, and metimes their condition is directly attributable to elay caused by waiting for the result of a swab xamination. Such delay is obviously dangerous, r it is generally agreed that the efficacy of antitoxin iminishes rapidly until the fourth day of the illness, fter which it is almost valueless. It may be of terest to quote some of the opinions expressed in ne reports of medical officers for 1929. The Plymouth eport says there is much misconception about he value of swab examinations: it should be realised nat a negative report does not exclude diphtheria, and nat a positive only serves to confirm the clinical iagnosis. Every year patients are being admitted t a hopelessly advanced stage, and to prevent this is necessary that the antitoxin should be given first nd the swab taken afterwards. From West Ham omes the statement that the present practice of wabbing all suspected throats has not resulted in ny improvement in prevalence or fatality; that it now a firmly established practice to swab and wait r the result of the examination before giving anti-oxin; and that results would be better if practitioners lied upon their clinical diagnosis alone. By way of ustration a case is recorded, in which a practitioner, is said, saw a suspicious throat on a Tuesday, took swab, received a negative report on Wednesday, and ecided it was unnecessary to revisit. On Friday he as sent for and found the whole of the fauces covered ith membrane. The child was admitted to hospital nd died three days later. The Croydon report entions that of 21 diphtheria deaths in hospital x occurred within a few hours of admission. It claimed that the giving of antitoxin as soon as a se is seen at home would reduce the mortality, and is pointed out that severe and even fatal cases have ot very infrequently given negative swab results. he report from Tottenham urges that diphtheria ould be treated immediately upon clinical evidence nly. The delay in waiting to give antitoxin until ne receipt of the bacteriological result often turns ne scale against recovery.

Dr. E. H. R. Harries contributes to the Birmingham port some particulars of 69 cases which ended tally in the City Hospital in 1929. Nine patients ed within 24 and six more within 48 hours of admission; 24 were swabbed before admission; but only five had had antitoxin outside the hospitals, and three of these had it after the arrival of the swab report. The patients admitted for diphtheria numbered 2099, of whom 706 presented no clinical evidence and had the diagnosis revised. Of these 706, 368 had been swabbed and the diagnosis was apparently based on a positive report; the remaining 338 had not been swabbed. Among the 368 swabbed, 105 showed nothing abnormal, whilst of the 338 unswabbed, only 39 were free from pathological conditions. Dr. Harries's analysis also shows on what day of the illness the practitioner was called in. In 26 of the 69 cases this was after the fourth day. Thus parental delay is apt to increase the need of promptitude in administration of antitoxin.

TREATMENT OF DIABETIC COMA.

WHEN insulin was discovered it was supposed that any patient could be saved from dying directly from diabetes. But although the mortality from coma has greatly decreased, a certain proportion of cases still end fatally despite treatment which is deemed appropriate. Various workers have lately studied the causes of this failure. Lemann,[1] for instance, points out that alkalis are useless in coma and may even do harm. He thinks that insulin not only eliminates the ketone bodies by oxidation, but also reduces the acidosis by increasing the plasma bicarbonates. According to this view, whether the coma be due to the accumulation of ketone bodies in the blood or to the concomitant acidosis, insulin is the best treatment and he attributes most of his failures to too small a dosage. Lawrence [2] and Coburn,[3] however, find that insulin alone is insufficient, and the latter supports this thesis by the report of cases temporarily recovering from coma in pre-insulin days. While their main line of treatment is similar, these authors differ in their views on the main underlying condition. Lawrence considers that the intense polyuria consequent upon the hyperglycæmia results in the severe dehydration of the patient, as revealed by rapid feeble pulse, low blood pressure, empty veins, low ocular tension, and increased hæmoglobin and blood concentration; and that this is the main factor in the failure of the patient to recover from coma. The remedy he proposes is administration of large amounts of fluid intravenously

[1] Lemann, I. I.: Amer. Jour. Med. Sci., August, 1930, p. 266.
[2] Lawrence, R. D.: Brit. Med. Jour., April 12th, 1930.
[3] Coburn, A. F.: Amer. Jour. Med. Sci., August, 1930, p. 178.

and as soon as possible by mouth. Coburn, on the other hand, views the coma as due to the ketonæmia, the elimination of the ketone bodies in the urine being prevented by a functional renal insufficiency, and he quotes cases in coma with no ketonuria but with a large accumulation of ketone bodies in the blood. Again the treatment consists in the administration of fluid intravenously, which, in Coburn's opinion, acts by stimulating the excretion of ketone bodies in the urine. Whichever view proves correct, the obvious lesson of these observations is that all patients should receive large amounts of fluid intravenously, supplemented as soon as possible by fluid by mouth, and that adequate quantities of insulin and glucose should be given in addition.

A GUIDE TO OFFICIAL STATISTICS.

A GUIDE which covers the whole of the statistical information contained in official publications by Government departments of Great Britain and Northern Ireland is issued annually by H.M. Stationery Office (1s.). The eighth volume to appear has now reached us, and like its predecessors is a book of hardly more than 300 pages which retains its slender bulk by a well-planned system of cross references. An explanatory introduction, when once mastered, enables even one quite unversed in extracting statistical information to find not only which current official publications contain the figures he requires, but also to what mode of analysis they have been subjected. The bulk of the volume is devoted to a subject index which must be consulted with discretion if effective use is to be made of the guide. For example, the Registrar-General provides various statistics concerning each of 205 "causes of death." The inclusion of a direct reference to each is not attempted, for such elaboration would make the guide too bulky; for example, no reference occurs in the subject index to "appendicitis." But the subject "deaths" gives the number (620) of the official publication in which these statistics are recorded and its price. When once the principle has been grasped the professional man will have no difficulty in finding the technical details he requires. Under "Medical Research" the publications of the Medical Research Council and of the Ministry of Health are all indexed under their special titles, though some of them are scientific monographs which give little statistical information. This is a concession which will certainly be appreciated by medical readers, whose needs are moreover met in several other sections.

ACTIVITY OF VITAMIN D.

THE Council on Pharmacy and Chemistry of the American Medical Association have laid down a specification for the estimation of irradiated ergosterol in terms of good quality cod-liver oil by biological tests. In this standard the cod-liver oil may obviously vary greatly; and Holmes and Piggott,[1] in studying the antirachitic value of irradiated ergosterol 100 D (i.e., nominally with 100 times the vitamin D content of cod-liver oil), found that none of the samples had uniform antirachitic activity, and further, that the best sample only had 60 times the activity of the best cod-liver oil tested. The samples of cod-liver oil examined also varied greatly in their vitamin D content. These findings strongly support the action of the Medical Research Council who have recently issued [2] a new standard of vitamin D. The have chosen as their standard a preparation made b exposing pure ergosterol to ultra-violet light und carefully determined and measured conditions whic can be repeated at will. The estimation of vitamin in any material is to be performed by comparing i action with that of the standard in similar experiment animals under the same conditions. By this mea the variable factor, the experimental animal and i environment, should be obviated as much as possibl Hess, Poncher, Dale, and Klein[3] have attempted t determine the prophylactic and therapeutic dose irradiated ergosterol (viosterol) 100 D prepare according to the American specification. They foun that in children in the first year of life ten drops a da was the smallest dose that would prevent a fall in th calcium and phosphorus of the blood. No case on larger dose than this developed any signs of ricket Ten to 15 drops of viosterol daily produced healing i mild rickets, but more severe cases needed up t 30 drops a day. Although large amounts wer administered for six to eight months, no ill-effec were noted beyond constipation and colic. For time some of the infants received as much as 2 times the prophylactic dose, and the investigation held to show that there is "a large factor of safety i the administration of larger doses of viosterol least over limited periods."

DIATHERMY IN OTO-LARYNGOLOGY.

THE different forms of diathermy in use by laryng logists are clearly described in a recent monograp by Dr. Dan McKenzie,[4] and since electrical metho are becoming popular in this specialty it is wort while to master the rather confusing nomenclatur In medical diathermy a uniform heating is produce by two electrodes of similar size, while in "surgical diathermy a large passive electrode is employed ar a small active electrode which concentrates th current at the required point and so raises th temperature of the tissues sufficiently to produ coagulation. Two modifications of the surgic method are "fulguration" (the discharge produce when the electrode is brought near to, but not contact with, the tissues), which destroys the mo superficial layers by desiccation, and the "ar incision," in which the tissues are divided by th electric arc from a sharp fully-charged electrod Surgical diathermy is the method more general employed in the treatment of diseases of the throa and it is with this that Dr. McKenzie is chiefl concerned. For non-malignant affections there is n convincing evidence of its superiority to the old methods with knife or cautery. Dr. McKenzie h performed tonsillectomy by dissection both with th diathermy knife and with the arc. The former is th slower method but is less likely to cause hæmorrhag during the operation, but by neither method bleeding obviated during the stage of separation o the sloughs. He considers that, for this operatio diathermy presents no particular advantages over th ordinary dissection with ligature of the bleedin points; indeed, the usual dissection method woul seem to be preferable, for any considerable la hæmorrhage is an extremely rare sequela to th operation. For patients suffering from the results

[1] Holmes and Piggott: New Eng. Jour. of Med., July 31st.

[2] See THE LANCET, August 30th, p. 503.

[3] Hess, J. H., Poncher, H. G., Dale, M. L., and Klein, R. I Jour. Amer. Med. Assoc., August 2nd, p. 316.

[4] Diathermy, Medical and Surgical in Oto-Laryngology. I Dan McKenzie, M.D., F.R.C.S.E., Consulting Surgeon, Centr London Throat and Ear Hospital. London: Kegan Pa Trench, Trübner and Co. 1930. Pp. 184. 10s. 6d.

nsillar sepsis, when tonsillectomy is contra-indicated the general condition of health, Dr. McKenzie efers piecemeal diathermy to other methods, such the galvano-cautery or London paste; he coagutes one or more areas of about 1 cm. in diameter intervals of once a week or longer, and the duration treatment is from two to four months. It is knowledged that there is some soreness, the produre is a very tedious one, and it is at least difficult ensure the removal of the whole tonsil and nothing it the tonsil. The only really satisfactory method of eating diseased tonsils still seems to be complete rgical removal, and this operation is rarely contradicated by the patient's general condition if careful tention be paid to the method of anæsthesia. It is the treatment of cancer that diathermy in these gions finds its most useful application, and Dr. cKenzie gives a very valuable description of its plication both to "operable" and to ineradicable ncers. In connexion with medical diathermy the thusiastic French exponent of the method, Dr. obert Leroux, is quoted freely. The author's most portant personal experience deals with the treatent of deafness and tinnitus. Of 47 cases under care 5 were cured, but 4 of these had only ted for a few weeks, 5 showed great improvent, 13 improved but tended to relapse, in 2 the nitus increased, and in the remaining 22 there was change. Of 11 cases of less than one year's duran, 3 were cured, 4 improved, and 4 unchanged. these findings it is recommended that practiners should advise diathermy for patients suffering m deafness and tinnitus after colds and influenza, d after acute otitis. Conservative family doctors ay claim that older methods of treatment give st as good results in these recent affections. In y case there is no doubt that surgical diathermy s proved its value in laryngology, especially in the eatment of malignant disease, and this lucid expoion of the technique and results of its application ll be appreciated.

A TRAVELLING CLINIC.

SINCE 1924 the provincial department of health of tario has maintained a travelling clinic for the agnosis of diseases of the lungs. Clinics are ganised only with the consent of the county or al medical society or, where no such society exists, the practising physicians. Only one centre has en visited where this consent was refused. The ff of the clinic consists of from one to three ysicians and a nurse. The equipment includes a rtable radiological unit and X ray films are taken every case. Tuberculin intracutaneous tests are ne on all children under 16 years of age. No case admitted to the clinic unless referred by the family ysician, and no information is given to the patient the time of examination. When the clinic returns Toronto and the radiograms are interpreted and data are correlated, a typewritten report is sent the physician who has referred the case. This ort includes history, physical findings, X ray erpretation, a diagnosis if possible, and any ommendations that might be helpful. In this y the clinic is intended to work directly with the dical profession in the public service—a service ich is supplied by the department without cost to ysician or patient. The clinic will deal with any st case referred to it, including non-tuberculous ses, definite cases of tuberculosis, suspicious cases, d contacts. Especial importance is, however, ached to the examination of the two latter types of cases, especially where children who have been in contact with tuberculosis. Up to the present time 160 sessions have been held in 75 centres, upwards of 8000 cases having been examined. It is the intention of the department to establish some 20 centres in the Province in which clinics will be conducted once or twice a year as may be required.

HUMAN TRYPANOSOMIASIS TREATED WITH TRYPARSAMIDE.

IT is now eight years since the tryparsamide treatment of human trypanosomiasis was instituted in the Belgian Congo, and a critical analysis of available case records has now been made by Dr. Louise Pearce and published as Monograph 23 of The Rockefeller Institute for Medical Research. The total number of cases considered is 1848. Most of them were infected with *Trypanosoma gambiense* and were in an advanced stage of the disease; a small number were infected with *T. rhodesiense*. Dr. Pearce has maintained a judicious and conservative attitude towards the effect of treatment, based, as it should be, on the conception that a drug adapted to general use in African sleeping sickness must have a biological action likely to benefit patients in advanced as well as in early stages of infection. Tryparsamide is the sodium salt of N-phenyl-glycineamine-p-arsonic acid; the compound was developed at the Rockefeller Institute for Medical Research and was synthesised by Jacobs and Heidelberger, its biological action having been studied by Brown and Pearce. Though the arsenic content of the drug is high (25·32 per cent.) the dose that can be administered to laboratory animals by any route is very large; but there is a comparatively narrow margin between the lethal dose and the dose that produces no apparent organic impairment. While therapeutic tests on mice and rats may give a fairly accurate indication of potential trypanocidal action they convey little idea of the actual curative value. The infected rabbit is the animal of choice, since it shows many of the conditions, including involvement of the central nervous system, which are found in man. In this animal tryparsamide has proved highly effective especially in *T. gambiense* and *T. brucei* infections. A drug which will cure a well-developed infection in the rabbit in the same unit dose as will destroy parasites in the circulating blood must have great penetrating power, and it is to this power the therapeutic activity of tryparsamide is ascribed. In experimental animals the trypanocidal action of the drug has been found less potent against *T. rhodesiense* than against *T. gambiense*, and experience with human infections confirms this variation.

The first investigation on the action of tryparsamide in African sleeping sickness was carried out by Dr. Pearce herself in 1920. At its conclusion supplies of the drug were given to physicians in charge of the hospital at Léopoldville as well as to others in the Belgian Congo, and to those in charge of the Pasteur Institute in Brazzaville, in French Equatorial Africa. Further studies were afterwards made in the Cameroons, Angola, Nigeria, the Sudan, Uganda, and Tanganyika Territory. For the most part these reports are concerned primarily with the treatment of native patients in hospital "concentration camps." The greater part of this monograph concerns itself with an analysis of these extensive data, the number of European and American patients treated with tryparsamide being small. The work is carefully annotated and elaborate appendices are included. Its study will show that the drug has now an

established value. The Report of the League of Nations on the Second International Congress on Sleeping Sickness states that all medical officers agree that the former methods of treatment should be replaced by tryparsamide. The examination of the cerebro-spinal fluid and the institutional treatment of all cases presenting modifications of this fluid is advised. The course recommended is one of 12 injections, the maximum dose being 2 g. In the Memorandum submitted by the British Colonial Office to the League of Nations Conference, the Uganda report refers to the prophylactic value of injections of tryparsamide for members of any hunting party. Sterilisation of the blood was found to persist for a considerable period after such injection so that mechanical transmission from one individual to another and also the cyclical infection of the fly should be prevented by this means.

OCCLUSION OF THE CORONARY VESSELS.

IT is now 25 years since A. G. Fryett showed that the coronary arteries could be injected post mortem with a substance opaque to X rays, making it possible to study these vessels and their branches in detail and note the changes in disease. Since then several observers have worked on these lines with variations in technique and apparatus. In the September number of the *Practitioner* appears an important radiographic study of these arteries with special reference to coronary thrombosis by Dr. E. Wyn Jones, from the heart department of the Liverpool Royal Infirmary. It differs from previous work in combining clinical observation of individual cases with subsequent pathological investigation—a method that should be fruitful of results. Dr. Wyn Jones—whose article was adjudged to be the best submitted in a competition open to practitioners of not more than two years' standing—devised his own method of injection, on the lines of the standard technique introduced by Louis Guss in 1921 but simpler and easier of manipulation. His findings agree in the main with those of previous investigators, but he is able to add two new facts to our knowledge: one, that in 5 per cent. of hearts the left coronary artery is the sole supply of the neuromuscular tissue, the other that 11 per cent. of all hearts possess three coronaries, the accessory vessel being found more commonly on the right in the proportion of 8 : 1. Possibly the latter is the accessory vessel demonstrated by J. S. Campbell in 1927 at a meeting of the Association of Physicians of Great Britain and Ireland, and judged by him to be a branch arising from the right coronary artery near its origin; this vessel was present in 20 per cent. of his series.[1] Dr. Wyn Jones notes that the coronary anastomosis becomes much more extensive with increasing age, a fact confirmed by others, and it is of interest to realise that previous coronary disease is an advantage to the patient whose artery is occluded; the gradual diminution of the lumen of the vessel by atherosclerosis allows an efficient compensatory anastomosis to develop, so that when the final block occurs the new anastomotic channels are ready to take on the necessary work. Again a condition of high blood pressure is also an advantage to the patient, for the fall of pressure consequent on the shock of the sudden thrombosis is not so great as it would be in a patient if the pressure were normal, and there is no delay in the opening up of new anastomotic channels. This has been shown to be the case experimentally animals, where the lower the blood pressure the larg the infarcted area produced.

Each observer who has investigated by the methods has been able to add something to o knowledge of the coronary artery circulation, a how it is affected by disease. More particularly are learning something of the cause for the vari individual reactions to blockage of the same ves or the same branch of a vessel. W. Spalteho in 1907, by means of his injection and cleari technique, claimed to have demonstrated that end-arteries existed in the heart, and that there wa rich anastomosis in all its muscular and endothel layers. Gross established the fact with his rad opaque bismuth injection technique. "The heart" he said, "is perhaps the richest organ in the body regards capillary and precapillary anastomoses betwe branches of the same main vessel and between branch from the two sides." Gross also showed that t accumulation of epicardial fat added to the hea a vascular sheath which slowly thickened with a and made anastomotic communications with t underlying muscle, thereby putting a new complexi on the behaviour of epicardial fat which up till th had often been suspect of causing sudden dea where no other cause could be demonstrated. Final Geoffrey Hadfield confirmed [2] Gross's statement a was able to show that the anastomoses in the epicard fat of the senile heart helped it to compensate to considerable degree for a diminished flow throu its atherosclerotic vessels, provided there was serious drop in blood pressure. Using the celloid technique of Morison followed by erosion in stro acid, Hadfield confirmed the presence of innumeral anastomoses, which explained recovery followi extensive coronary occlusion. In the future it m prove possible to inject some substance opaque X rays into the veins of the living subject, permitti a detailed examination of the coronary circulati during life.

THE ORAL INJECTION OF LIPIODOL.

FOR introducing lipiodol into the lungs oral injecti seems to be the method of choice in America, and increasingly employed in this country. The ea with which it can be done is often almost incredib With no previous anæsthetisation, with the patie sitting on a chair and holding out his own tong and with apparatus no more elaborate than ordinary 20 c.cm. syringe and a straight cann the oil can be steadily dropped over the back of t tongue into the trachea, and the whole affair may over in three or four minutes. Many patients w declare themselves unaware that anything is happe ing, but others, of course, are intolerant. Othe again, while appearing to allow the oil to desce the trachea, will hold the oil above the glottis a then expel it all by a sudden cough. In such a ca it is an advantage to be able to see exactly where t oil is going, and Arnold Josefson, of Stockhol has described [3] an instrument for this purpo It consists of a curved spatula along the upper surfa of which is affixed a cannula projecting beyond t end of the spatula; above this is a lamp and laryngeal mirror. Such a device may be of value difficult cases, but with gentle persistence it will found that even the intolerant are often able to all the oil to flow down the trachea. Lipiodol injectio

[1] THE LANCET, 1926, ii., 168.

[2] Brit. Med. Chi. Jour., 1927, xliv., 257.

[3] Acta Med. Scand., 1930, lxxiii.,

e so important in diagnosis, and the oral method so simple and so infinitely more agreeable for the tient than the crico-thyroid route, and so free of l dangers, that every effort should be made to quire the technique. Some say it is impracticable d inferior to other methods, but this is not the rdict of more experienced workers. By suitable sture during and after injection, the oil may be ade to reach the very apices of the lungs by the oral ute, as was well shown in the paper by Dr. W. rton Wood which we published on June 21st . 1339). A full description of the method, which was rked out especially by J. J. Singer, of St. Louis, ay be found in a monograph on lipiodol in the agnosis of thoracic disease reviewed in our columns st year.[4]

HOSPITAL SWEEPSTAKES.

APPARENTLY the promotion of hospital sweepstakes likely to become a special line of business in the ish Free State. There is, in the first place, the veepstake being organised on the Manchester ovember Handicap by a committee representative six of the Dublin hospitals. This committee has en registered as "Hospitals' Trust, Ltd." It pears to intend to widen its scope in future, for is stated that a meeting was recently held, on the vitation of the hospitals concerned in the Trust, of presentatives of the boards of several hospitals roughout the Irish Free State, to arrange for a more neral participation in future sweepstakes. Reprentatives from institutions in Cork, Limerick, aterford, and Louth, as well as from several in ublin, were present, and tentative agreement was ached to organise a sweepstake on next year's rand National. Side by side with this enterprise, new private company was registered last week der the title "The Charities Guild, Ltd." with the ject of promoting sweepstakes and drawings of izes in aid of charitable institutions in the Irish ee State. The managing director is, according to e press, a "well-known turf accountant." The story of the first sweepstake will be watched with uch interest by those concerned with hospital ance. Whether sweepstakes are to become one the principal sources of revenue to Irish hospitals to sink into disuse will depend on two factors—mely, the amount of money subscribed, and the oportion of it that reaches them.

ŒDEMA DUE TO INANITION.

AT the end of the Great War the prevalence of lema, called "war œdema" or "famine œdema," tracted considerable attention in Central Europe, well as in other parts of the world. It was associated th a very poor diet, consisting almost entirely root vegetables, and various explanations of it were ven. Many observers referred it to the high salt ntent of the diet, but A. Schittenhelm and H. hlecht,[5] who studied the condition in prison camps, ncluded that it was best treated by rest and creased fat and protein in the diet. In 1920 A. Kohman,[6] who was investigating the dietary operties of carrots with rats, found that when the et consisted of little else a certain number of the ts upon it tended to develop œdema. Further vestigation seemed to inculpate the protein as the ly significant factor. Œdema in a monkey, fed on diet in which the only proteins were those derived from maize, was described by H. Chick and E. M. Hume[7]; the œdema was rapidly cured by administration of casein. After the war period the urgent practical interest in the problem died down, and it was left in an interesting but inconclusive position for nearly ten years. Last year R. A. Frisch, L. B. Mendel, and J. P. Peters[8] repeated and extended Kohman's work and have established that œdema is produced in rats on a diet in which the protein is entirely derived from carrots. The œdema is accompanied by a marked lowering of the serum proteins, which after two to three months are reduced by 40 per cent. When starch up to 18 per cent. of the total calories is withdrawn from the diet and replaced by casein, the œdema does not develop and the serum proteins are maintained. It is pointed out that E. H. Starling[9] first showed that the colloid osmotic pressure of the serum is proportional to the concentration of protein in it, and he advanced the theory that decreased osmotic pressure in the serum is responsible for the deposition of water in the tissues. Starling's suggestion was subsequently contested but the work just quoted substantiates it, besides affording confirmatory evidence of the dependence of war œdema upon a poor protein supply.

Not long ago Dr. F. J. Poynton and Dr. J. V. Macgregor described[10] in our columns a fatal case of gastro-jejuno-colic fistula in which œdema developed in consequence of deficient absorption, and two less serious cases have lately been reported at the Mayo Clinic by Dr. A. M. Snell.[11] Both Dr. Snell's patients were suffering from pyloric obstruction and had for some time been on inadequate diets, and both had required the administration of large quantities of fluid. The precipitating factor may have been the enforced abstinence from food after operation. Pitting œdema appeared in the legs of the first patient, a woman aged 61, fifteen days after excision of an ulcer and posterior gastro-enterostomy. Marked œdema developed a fortnight after the same operation in the second patient, a plumber aged 44. Investigation of the blood showed that at this time the serum proteins were about 30 per cent. below the normal level—i.e., about 5 g. per 100 c.cm. In both cases there was marked secondary anæmia, which may have interfered with the oxygenation of the tissues and reduced the permeability of the capillaries. The patients were given a diet of high vitamin content with an adequate supply of protein; the first had full doses of ferric citrate and rapidly improved until, at her discharge about six weeks later, the concentration of serum proteins was 7·7 g. in 100 c.cm. and the hæmoglobin and red blood-cell count were practically normal. The second patient had a transfusion of 500 c.cm. of blood, which caused moderate diuresis for two days. After this the œdema was greatly reduced and the serum proteins rose to 5·9 g. in 100 c.cm. Both patients made complete recoveries. These mild grades of inanition œdema must, Dr. Snell thinks, often escape recognition. Provided that the causative disease is not progressive and a high protein diet can be taken, treatment is very effective.

[4] THE LANCET, 1929, i., 670.
[5] Berlin klin. Woch., 1918, lviii., 1138.
[6] Amer. Jour. Physiol., 1920, li., 378.
[7] Biochem. Jour., 1920, xiv., 135.
[8] Jour. Biol. Chem., 1929, lxxxiv., 167.
[9] Jour. Physiol., 1895, xix., 342.
[10] THE LANCET, August 2nd, 1930, p. 240.
[11] Proc. Staff Meetings, Mayo Clinic, July 9th, 1930.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—At the provincial meeting of this society to be held at Lowestoft on Sept. 19th–20th, the members will be entertained by the Mayor and Corporation of Lowestoft at luncheon on the 20th and not on the 19th as stated in our previous notice.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCVI.

TREATMENT OF CASES OF ABORTION.

PART I.*

BLEEDING from the uterus is almost invariably a precursor of abortion, but there are many pregnancies in which there has been some bleeding that go to term. If bleeding occurs during pregnancy before the child is viable, it must be regarded as a threat of abortion, and it is impossible to say at the onset of the bleeding whether or not the pregnancy can be saved. If the bleeding is free, and there are uterine contractions, there is much greater risk of the pregnancy being destroyed than if there is only slight loss, but in many cases with a very small amount of bleeding the abortion ultimately becomes complete; again in some where the bleeding is extremely severe the pregnancy may continue. All cases of bleeding early in pregnancy must be treated as only threatened abortions until there are definite physical signs that abortion is inevitable, except when the bleeding is so severe as to be a danger to the woman's life. In many cases where abortion is threatened the woman is mentally disturbed and upset at the thought of losing her child, and this state of agitation seems to have an influence in increasing the activity of her uterus and so making an abortion more likely to occur. Any added worry or disturbance caused by anxious relatives or by examination of the patient increases the risk of making a threatened into an inevitable abortion.

In dealing with cases soon after the onset of bleeding, unless the loss is very profuse the patient should be put to bed with as little fuss as possible and given sedatives to reduce her anxiety and to diminish the activity of her uterine muscle. At this stage vaginal examination should be avoided, but if the pregnancy has reached the stage at which the uterus should be palpable a gentle examination of the lower abdomen should be made to make sure that the uterus is of reasonable size for the duration of the pregnancy. If the pregnancy is thought to be in the first two months or so it is wise to inspect the breasts and to make inquiries about symptoms to be sure if possible that the woman is actually pregnant. In the early part of the treatment of threatened abortion the type of sedative needed is one that acts powerfully and quickly, and for this purpose morphia is perhaps the most certain and convenient, but heroin and omnopon are good and may be used in place of morphia. At the onset of the bleeding, after ascertaining the amount of loss and satisfying myself that there is no reason to suspect extra-uterine pregnancy, I give an injection of morphia gr. $\frac{1}{4}$, and if after a few hours the bleeding shows signs of stopping I give 30 grains of bromide and order a mixture containing 20 grains to be given three times a day. If all loss of fresh blood has ceased after three or four days the bromide can be discontinued, but the patient should be kept in bed at least a week from the time the discharge has ceased to be red. If the bleeding does not stop or obviously diminish in six or eight hours after the morphia has been given, another injection may be tried, and if this fails a vaginal examination must be made as already signs that the abortion is inevitable may be present and further attempts to save th pregnancy are useless.

Inevitable Abortion.

Abortion is inevitable if any part of the ovum can b felt at the external os; when this is possible it mean that the cervix has been taken up and the ovum is i process of extrusion. It is often difficult to be quit certain that what is felt at the external os is part o the ovum and not clot, and to satisfy oneself that th cervix is taken up, especially in a multipara with damaged cervix. When the amniotic sac is presentin and felt there is no great difficulty in recognising it but clot and a mass of chorion may easily be mistake for one another, and as too thorough an examinatio may do harm it is better to wait and assume tha what is felt is only clot and to carry on treatment fo threatened abortion. If any part of the decidua o the ovum has come away abortion is certain to occu but is then classified as an incomplete and not as a inevitable abortion. Perhaps the part of the ovu that can be expelled most easily without attractin notice is the amniotic fluid, but if this has escape there is no hope of the pregnancy continuing.

When the abortion is inevitable or incomplete ther is nothing to be gained by delay in its completion an the sooner the uterus is empty the better. In th absence of bleeding reasonable time should be allowe for the uterus to empty itself naturally, and this i especially important if the pregnancy has gone as fa as the fourth month, because at or after this tim evacuation of the uterus may be extremely difficul and dangerous until the cervix has dilated enough t allow the head to pass through it. Usually th progress of labour in inevitable or incomplete abortion is fairly quick, and within 10 or 12 hours th uterus empties itself; so that all that is needed is t keep the woman in bed under observation in cas there should be bad bleeding while the abortion is i progress. Fortunately, the later the pregnancy th more likely is the uterus to expel its contents, so tha it is not very common to have to resort to surgica evacuation after about the fourth month. In suc cases, if there is delay and the os is only slightl dilated, it is best to deal with the case as with a labour a term and wait for natural delivery, unless interferenc is necessitated by severe bleeding; when this occur rupture of the membranes may hasten delivery, o packing the vagina may be needed to stop th hæmorrhage and cause dilatation of the os by stimu lating the activity of the uterus.

In abortions occurring in the first three months if after 10 or 12 hours the uterus is not emptying itself, drugs to stimulate uterine activity should b tried; a drachm of liquid extract of ergot, 1 c.cm. o 10 per cent. pituitary extract, or a drachm of one o the newer preparations of ergot such as ernutin may be given, and half these doses repeated three or fou times in the next 24 hours. If after this the ovum is not expelled, the probabilities are that it wil be retained for a considerable time, and it is bette to evacute the uterus than to wait longer. Until th uterus is empty there is always some risk of free o even dangerous bleeding occurring, so when th likelihood of early natural expulsion has become smal this risk should be avoided by completing the abortion There is also some risk of infection of the retaine products, which is reduced by removing them. The early ovum in cases of inevitable or incomplet

* Part II. will appear next week.

abortion is usually very easily removed, as it is often lying in the lower segment of the uterus and detached or only adherent over a small area.

Removal of the Early Ovum.

The patient should be anæsthetised and prepared for a vaginal operation and the vagina swabbed out thoroughly with 1 in 2000 perchloride or biniodide of mercury solution. The cervix is then drawn down and painted with 2 per cent. iodine. Frequently the cervical canal will admit the finger, and if so the presenting ovum should be detached and removed by the finger and ovum forceps. If the finger cannot be passed through the canal the cervix should be dilated with metal dilators until this is possible; after removing the ovum the cavity of the uterus should be explored to make certain that it is empty, and any fragments found should be removed by the finger or the blunt curette and the cavity swabbed out with a strong antiseptic. The antiseptic I am in the habit of using is a spirit solution containing grs. 75 of iodine and grs. 96 of potassium iodide to the ounce. It is important to remember in exploring the cavity for fragments of ovum that the placental site is rough and somewhat raised, and may feel not unlike a retained piece of ovum, and also that the wall of the uterus is soft and may be perforated by too vigorous attempts to remove retained fragments even with the blunt curette. After an abortion, whether terminated naturally or not, the patient should be kept in bed at least one week, and if the pregnancy had reached four months it is better not to allow the patient up in less than ten days.

Retained Products.

After a threatened abortion has been treated with apparent success, it is not quite certain that the pregnancy has been saved, because the ovum may have died at the time of the bleeding and be retained in the uterus for a considerable time without causing further bleeding. A woman who has had bleeding during a pregnancy should be seen a few weeks later to make sure that the uterus is increasing in size and the breasts developing in the ordinary way. If there is any doubt of the ovum being alive it may be necessary to wait another month before a definite diagnosis of retained dead ovum or carneous mole can be made, and then if there is no sign of its being expelled by the uterus, the cervix should be dilated and the retained ovum removed in the same way as in the case of inevitable abortion. If there is bleeding or brown discharge ergot should be given a trial before dilating the cervix.

J. P. HEDLEY, F.R.C.S. Eng.,
Obstetric Physician to St. Thomas's Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. C. V. Griffiths to *Victory* for R.N. Hospital, Haslar; O. D. Brownfield to *Dorsetshire*; and J. H. Burdett to *Pembroke* for R.N. Hospital, Chatham.

Surg. Lt.-Comdr. A. de B. Joyce to *Victory*, additional for R.N. Hospital, Haslar.

Surg. Lts. J. C. Souter to *Tarantula* and A. M. Lawrence-Smith to *Cicala*.

Surg. Lts. A. L. Moorby and E. R. P. Williams are transferred to Permanent List.

ROYAL NAVAL RESERVE.

Surg. Lt. A. Elliott to *Vivid*, for R.N. Barracks.

Surg. Sub.-Lts. A. R. Hunt promoted to Surg. Lt., and A. D. Lendrum to *Victory* for R.N. Hospital, Haslar.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. A. L. Gunn to *Victory* for R.N. Hospital, Haslar.

Surg. Sub.-Lt. R. J. Davies to *Vivid* for R.N. Barracks.

Proby. Surg. Sub.-Lt. L. A. De Dombal to be Surg. Sub.-Lt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. R. J. Franklin retires on ret. pay.

The undermentioned Majs. (temp. Lt.-Cols.) to be Lt.-Cols.: C. Scaife, vice Lt.-Col. R. J. Franklin, to ret. pay; E. B. Lathbury, vice Lt.-Col. R. C. Wilmot, promoted.

The undermentioned Majs. to be temp. Lt.-Cols.: E. D. Caddell and B. Johnson.

Maj. R. I. Sullivan, from the secd. list, is restd. to the estabt.

ARMY DENTAL CORPS.

Lt. G. T. Drummond, temp. Dental Surg., to be Lt. (on prob.).

TERRITORIAL ARMY.

Lt. C. C. Taffs is restd. to the estabt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

R. H. Franklin (late Lt., R.A., T.A.) to be Lt.

ROYAL AIR FORCE.

RESERVE OF AIR FORCE OFFICERS.

Flying Officer F. G. Mogg, of the Special Reserve, is promoted to the rank of Flight-Lt.

INDIAN MEDICAL SERVICE.

Majs. to be Lt.-Cols: J. Scott, F. W. Hay, S. M. Hepworth, H. S. Cormack, K. G. Pandalai, J. L. Sen, C. A. Wood, P. B. Bharucha, and L. H. Khan.

The undermentioned appts. are made: D. J. Young and P. L. O'Neill to be Lts. (on prob.).

The undermentioned officers retire: Lt.-Cols. J. McC. A. Macmillan and T. C. McC. Young.

Lt. V. H. Sarland resigns his commn.

INDIAN MEDICAL DEPARTMENT.

Sen. Asst. Surgs. and Lts. to be Senr. Asst. Surgs. and Capts: A. Bayley-de Castro and R. H. G. Thompson.

First Class Asst. Surgs. to be Senr. Asst Surgs. with rank of Lt.: A. D. Campbell (secd.) and J. G. Johnstone.

Senr. Asst. Surg. and Maj. T. W. Twells retires.

NORTH PERSIAN FORCES MEMORIAL MEDAL.

Captain H. W. Mulligan, M.B., Indian Medical Service, has been awarded the North Persian Forces Memorial Medal for the year 1929 for his paper, Studies on the Reticulo-endothelial System, with Special Reference to Malaria, published in the *Indian Journal of Medical Research* (1929, xvi., 1099). This medal is awarded annually for the best paper on tropical medicine or hygiene published during the preceding 12 months by a medical officer, of under 12 years' service, of the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or of the Colonial Medical Service.

A COURSE OF PSYCHOLOGICAL MEDICINE FOR THE PRACTITIONER.—Twenty-four lectures on Psychological Types and Mechanisms will be given at the Tavistock-square Clinic for Functional Nervous Disorders, 51, Tavistock-square, London, W.C. 1, on Wednesdays, beginning Oct. 1st. Dr. E. Graham Howe will lecture from 3 to 4 P.M. every week, the subjects being:—Nerves: Physical and Mental Disorder contrasted; the Neurological and Analytical Viewpoints; Causes of Mental Disorder.—Dynamic Psychology and the Conception of Purpose: Conscious and Unconscious Conflict; Repression; Rationalisation.—The Way the Mind Works: Symbolism, Dreams, and Symptoms.—Emotional Development: (*a*) Racial Factors; (*b*) Individual Factors.—Law: the Rôle of the Father.—Love: the Rôle of the Mother.—Sexual Contrasts: Sadism and Masochism.—Adaptation: Fear; Guilt; Inferiority; Over-compensation.—Wish Fulfilment: Projection.—Resistance and the Unconscious Motive.—A Conception of Mental Disorder: Good and Bad Adjustment. Dr. H. Crichton-Miller will lecture from 4.30 to 5.30 P.M. on Introversion and Extraversion.—Thinking and Feeling Types.—Intuitive and Sensorial Types.—Aggression and Surrender: Sadism and Masochism.—Art and the Creative Type.—Compulsions and the Repetitive Type.—Epilepsy and Psychasthenia.—Neurasthenia and Vagotonia.—Anxiety and Sympathicotonia.—Hysteria and the Ovarian Type.—Dementia Præcox and the Schizoid Type.—Manic Depression and the Cycloid Type. The lectures are open to the medical profession only. Tickets for the course can be obtained in advance from the Hon. Lecture Secretary at the Clinic.

SPECIAL ARTICLES

A DIETARY SURVEY

OF SIX HUNDRED AND SEVEN FAMILIES IN SEVEN CITIES AND TOWNS IN SCOTLAND.*

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AND
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IN the course of the investigation already reported in THE LANCET [1] on the effect of feeding milk to school-children, information on the dietaries of the homes of a number of the children was collected by Dr. K. Rounsfell Brown, Dr. A. F. Turner, Dr. E. M. Henderson, and Dr. H. M. Morrison in the winter and spring of 1926–27. The collected data have since been analysed by Miss Clark who has drawn up and arranged in convenient form the information, including the tables, given in the present report.

Methods of Investigation.

COLLECTION OF INFORMATION.

For the collection of the information, printed forms with sections for each class of common food, with a space for additional foodstuffs, were used. To minimise the risk of items being omitted, the enumeration of the foods in common use was fairly extensive. One of these forms was used for each household. A note was taken of the composition of the family, and a record was made of the food consumed for the period of a week. In some families occasional meals, as for example dinners at schools or soup kitchens, were taken outside the home. Information with regard to the nature of these was obtained and the necessary additions made in calculating the total food consumption of the family. The investigators attempted, by personal observation or by comparing the statements made on consecutive visits, to check the accuracy of the information supplied by the housewife. A thorough and effective check of food consumption was, of course, obviously impossible. It should be noted, therefore, that the basal data consist essentially of statements of the housewife, and not of direct observations of the investigators.

In each case the investigator made a note as to the reliability of the information received. All cases which were regarded as being unreliable were rejected. In addition, some sheets, though regarded by the investigator who collected the information as being reliable, were rejected because internal evidence showed a probability of errors or omissions. In all, 700 sheets were completed. After throwing out unreliable cases there were left 607 which, so far as is known, give a relatively accurate account of the weekly consumption of food in the households concerned.

This method of collecting information on the dietaries of households is obviously much less accura than the intensive methods used in studies suc as those made by Noel Paton and Cathcart, in whic the amount of food consumed was determine accurately in a small number of households. O the other hand, the present method, though le accurate for each household, enabled a wider fie to be covered by the workers in the time availabl While there may be some doubt as to the probab error of the quantities of foodstuffs consumed, it believed that the records of the kind of foodstuf used in the various households are fairly accurat and give an indication of the quality of the die It was thought that if the caloric intake as calculate from the data was found to be in agreement wit that obtained in the more intensive surveys, th information collected might be regarded as sufficient accurate to warrant drawing tentative conclusio as to the quality of the diets.

WORKING UP DATA.

Plimmer's tables [2] were used for the calculation the protein, fat, and carbohydrate content and th caloric value of the diets, and Sherman's [3] for th mineral content, except in the case of iron where th data of Peterson and Elvehjem [4] were used. F foods not given by these authors, data were obtaine in some cases in the Physiology Department Glasgow University or in the Rowett Institut In other cases where no data were available foodstuf were analysed. The consumption of some articl such as eggs, oranges, bananas, and vegetables w stated in quantities instead of weights. These we assessed on an average weight ascertained by tri at shops.

The percentage of inedible material in vegetable fruits, meat, and fish according to Plimmer's tables deducted. No allowance, however, is made for was or loss in cooking. The figures given in the tabl therefore, show the amount of edible material enteri the home and not the amount actually consume The Food Committee of the Royal Society [5] estimate that 10 per cent. should be allowed for waste. Th amount consumed would, therefore, according this estimate, be on an average 10 per cent. belo the amounts stated in the following tables.

As the food requirements of men, women, an children of different ages vary it is obviously necessar in dietary surveys to have a standard of compariso The standard taken is the food requirements of a average man. The man value standard used in th earlier studies in Great Britain was that of Atwater Atwater, however, under-estimated the food requir ments of both women and children. In Lusk's standard, which was used in later investigations, th requirements of women and children were increase In the present investigation the Cathcart standar given below is used. The main difference betwee

Cathcart's Standard of Food Requirements.

Man	1·00	Child 8–9	0·
Woman	0·83	,, 6–7	0·
Boy 14	1·00	,, 3–5	0·
Girl 14	0·83	,, 2	0·
Child 12–13	0·90	,, 1	0·
,, 10–11	0·80	,, 0	0·

the Cathcart and Lusk standards is that the form assesses the requirements of children under 2 years a lower level and of children of 8 and 9 at a high level than Lusk.

* Part of the expenses of this Survey was defrayed by a grant made to the Department of Health for Scotland by the Empire Marketing Board. The Nutrition Committee of the Medical Research Council were kept informed of the progress of both this and the previous investigation on the effect of milk on school-children, and acknowledgment is made for the helpful advice and criticisms obtained from the Committee, who are, however, not in any way responsible for the accuracy of the data or views expressed.

In considering the man value of each family in this tudy, no account was taken of the nature of the ccupations of the adults. All adult males are given value of 1·00, and all adult females one of 0·83.

In most of the surveys made in this country atten- ion has been confined to the energy-yielding onstituents of the diets—viz., the proteins, fats, and arbohydrates. It will be convenient, therefore, in omparing the results obtained in this survey with revious work to deal with these first, and then later ith the calcium, phosphorus, and iron contents hich were also calculated in the present survey.

Results.

A. ENERGY-YIELDING CONSTITUENTS.

Table I. gives the mean value with standard devia- ion and coefficient of variation for the 607 households.

TABLE I.—*Per Man Value per Day.*

—	Man value.	Calories.	Protein.	Carbo-hydrates.	Fat.
lean ..	4·86	3608·9	107·78 g.	574·43 g.	86·11 g.
tandard D.	1·68	755·4	24·68 g.	128·62 g.	24·71 g.
o-efficient of variation	34·6	20·93	22·90	22·39	28·69

The consumption in the individual households aried widely from the average figures quoted above, s is shown by the size of the standard deviation and oefficient of variation as well as by Table II., which ives the number of households in which the caloric ntake and the consumption of protein, carbohydrate, nd fat fall within the ranges indicated. The orizontal lines indicate the limits for the generally ccepted standard for an adequate diet.

TABLE II.

Calories.		Protein.		Carbohydrates.		Fat.	
Amount	No. of cases.	Amount (g.)	No. of cases.	Amount (g.)	No. of cases.	Amount (g.)	No. of cases.
500–1750	1	40– 50	1	200–250	1		
750–2000	1	50– 60	7	250–300	—		
000–2250	11	60– 70	18	300–350	11	20– 30	1
250–2500	16	70– 80	46	350–400	35	30– 40	5
500–2750	46	80– 90	74	400–450	51	40– 50	27
750–3000	52	90–100	107	450–500	86	50– 60	48
000–3250	85	100–110	97	500–550	93	60– 70	84
250–3500	83	110–120	78	550–600	101	70– 80	100
500–3750	77	120–130	73	600–650	73	80– 90	101
750–4000	64	130–140	41	650–700	54	90–100	87
000–4250	52	140–150	27	700–750	39	100–110	53
250–4500	35	150–160	22	750–800	25	110–120	43
500–4750	31	160–170	6	800–850	22	120–130	26
750–5000	23	170–180	8	850–900	9	130–140	18
000–5250	16	180–190	1	900–950	5	140–150	6
250–5500	7	190–200	1	950–1000	2	150–160	3
500–5750	5					160–170	2
750–6000	2					170–180	2
						180–190	1
	607		607		607		607

Calories.—The average consumption in calories ound in representative previous studies in Britain are s follows :—

	Calories.
Noel Paton,[8] Edinburgh, 1900, for 19 families.. ..	3233
Medical Research Council Investigation,[9] 1924, 140 miners' families, Scotland and England..	3005
Hill, Essex,[10] 1925, 90 families	2872
Medical Research Council,[11] 1926, 79 families	2686

In the United States, Sherman and Gillett,[12] n a study of 92 families, found 11 below 2000 calories, nd 22 above 3500. McKay, Ohio,[13] in 47 families found an average of 3587 calories. In a study in Tennessee[14] with 64 families, the average for the town was 3650 and for the country 3731. In Georgia,[15] in a study of 14 families, the average was 4243. In other countries Mason[16] estimates the pre-war food consumption in Germany as 4780, and Komu and Sokamoto[17] give records of two Japanese labourers with diets averaging 3768.

In all the previous studies which included a consider- able number of families there was found, as in the present investigation, to be a wide variation in the caloric consumption. For example, in Noel Paton's study of 19 families the range was from 1834–4796. In McKay's of 47 families the range was from 2081–5828. In the Medical Research Council investigations of 79 families the range was from 1396 to 3916 calories.

It is difficult to compare the results of the present survey with former ones owing to the different standards of man value used. In Noel Paton's Edinburgh studies Atwater's standard was used, and in the later ones Lusk's. The difference between the man values of the average family on the two standards has been found to be about 14 per cent. Cathcart's standard used in the present survey would be higher or lower than Lusk's according to the ages of children in the family. The other complicating factor already referred to is that the present investiga- tion merely gives the amount of food used in the house without making any allowances for wastage whereas in the other studies made in this country the amount actually consumed was determined. As already indicated the wastage not deducted in the present investigation is probably about 10 per cent. Taking account of these factors it would appear that the average found in the present investigation is slightly higher than that of previous investigations in this country, but is lower than three out of the four United States studies, and lower than Mason's estimations for pre-war Germany, or Komu and Sokamoto's records for Japanese labourers.

Calorie Requirements.—The standards for an adequate diet as set by various authorities vary from 3000 to 3500. Table II. shows that out of the 607 families, 127 fall below 3000, and 312 are above 3500. On the arbitrary assumption that 2500 is the lower limit for a sufficient diet, 29 houses out of the 607 were receiving too little food. On the other hand, in 171 houses the amount of edible food entering the home was over 4000 calories per man—an amount which indicates either an unnecessarily high consump- tion or excessive waste.

Table III. shows the proportion of the total number of calories supplied by protein, fat, and carbohydrates respectively in the seven towns.

TABLE III.—*Per Man per Day.*

No. of families	Town.	Protein.		Carbo-hydrates.		Fat.	
		g.	%	g.	%	g.	%
106	Edinburgh	100·3	12·4	516·3	63·4	84·4	23·5
57	Glasgow	108·9	12·1	575·2	63·9	95·5	24·0
37	Dundee	97·9	11·9	538·0	65·4	82·2	22·7
143	Aberdeen	107·9	12·5	561·0	65·1	84·8	22·3
103	Peterhead	126·1	12·5	685·7	68·2	85·2	19·2
31	Paisley	107·2	12·9	577·9	65·2	88·4	22·6
130	Greenock	101·7	11·9	557·7	64·8	86·9	23·0

There is a remarkable degree of uniformity between the different towns. In Peterhead the percentage of carbohydrates is higher and that of fat lower than in any of the other towns. This is due to the fact that the consumption of syrup and treacle appears to be greater, and that of butter and margarine less in this

town than in the others. The average percentage for the total households of all the towns as calculated from Table I. is: protein 12·3, carbohydrates 65·5, fat 22·2. This approximates very closely to the standard proposed by the U.S. Division of Food and Nutrition as the standard proportion for army diets: protein 12·5, carbohydrates 62·5, fat 25·0.

Protein.—The percentage of protein found in the present investigation is higher than that of most of the previous British studies. In the four already quoted, Edinburgh [8] gave 13·6, Miners [9] 10·0, Essex Rural [10] 10·7, and Scottish Urban and Rural [11] 11·3.

In the present study 41·7 per cent. fall below 100 g., but only 8, or 1·3 per cent., out of the 607 families receive less than 60 g.

Fat.—The fat percentage (22·2) of the present study is lower than that of any of the four British studies: Edinburgh 25·3, Miners 29·9, Essex Rural 22·9, Scottish Urban and Rural 26·4. The Inter-Allied Scientific Food Commission regarded 75 g. of fat daily (20–25 per cent. of the total energy value of the diet) as necessary, Voit [18] and Rubner [19] 55–60 g. In the present study only 6 families have a consumption of less than 40 g. daily, and only 13·3 per cent. fall below 60 g.

The foregoing consideration of the data on the energy-yielding constituents shows that there is no general shortage of any of these in the diets of the households studied. Of 607 families in only two cases is the intake below 2000 calories. Only eight received less than 60 g. protein, and only six less than 40 g. fat per man value. There is thus no evidence of any widespread under-nutrition.

B. NON-ENERGY YIELDING CONSTITUENTS—CALCIUM, PHOSPHORUS, AND IRON.

The mean standard deviation and coefficient of variation for calcium, phosphorus, and iron are shown for the seven towns singly in Table IVA., and combined in Table IVB.

TABLE IVA.—*Food Constituents and Standard Deviation in Grammes.*

City ..	Aberdeen.	Dundee.	Edinburgh.	Glasgow.	Greenock.	Paisley.	Peterhead.
Families ..	143	37	106	57	130	31	103
M.M.V. ..	4·89	5·46	5·45	4·69	4·71	4·85	4·48
Mean Ca* ..	0·97	0·70	0·65	0·89	0·72	0·67	1·19
S.D.* ..	0·31	0·21	0·21	0·35	0·25	0·22	0·34
C. of V. ..	31·69	29·31	32·91	40·77	34·83	32·82	28·87
Mean P.* ..	1·75	1·44	1·46	1·72	1·57	1·57	2·14
S.D.* ..	0·34	0·26	0·36	0·54	0·40	0·40	0·48
C. of V. ..	19·28	18·35	24·89	31·55	25·63	25·55	22·44
Mean Fe* ..	0·015	0·011	0·012	0·014	0·012	0·011	0·020
S.D.* ..	0·008	0·002	0·003	0·005	0·004	0·004	0·005
C. of V. ..	51·35	19·76	26·94	38·25	30·42	33·22	24·65

* = Grammes. M.M.V. = Mean man value.

TABLE IVB.—*Per Man Value.*

	Ca.	P.	Fe.
Mean	0·86 g.	1·70 g.	0·0143 g.
S.D.	0·34 g.	0·46 g.	0·005 g.
C. of V. ..	39·94	27·39	34·46

The mineral content has not been estimated in dietary studies previously undertaken in Britain, but figures are reported from studies in other countries.

Calcium.—Sherman, Mettler, and Sinclair,[20] in an American dietary study calculated the average calcium consumption to be 0·57 g. per day for a man 0·59 g. for a woman. Tigerstedt,[21] in Finnish diets found that the daily calcium intake ranged from 1·58 g. for children 2–3 years old up to 3·79 g. for men. Horneman,[22] in 1913, estimating food actually consumed in German households, found the calcium intake to be for a man 1·227 g., for a woman 0·615 g. and for a 6 year old child 0·427 g. Sherman and Gillett (loc. cit.) in the 92 American dietaries, showed the average calcium consumption to be 0·72 g.

In the present study the mean of the combined Scottish towns is 0·86 g. The high calcium intake appears to be due to a more liberal supply of milk and treacle, both of which are rich in this element.

From all the evidence available Sherman,[3] in 1927 calculated the minimum maintenance requirement in calcium to be 0·45 g. daily, and considers 0·68 g. necessary to allow a margin for safety. From Table V., which gives the range of intake, it will be seen that 47 families, or 7·7 per cent., fall below 0·45, and 149 or 24·5 per cent., fall below 0·60 g. which is slightly below Sherman's safety limit and roughly about 20 per cent. fall between 0·60 and 0·75 g.

Phosphorus.—The average phosphorus consumption in Sherman, Mettler, and Sinclair's (loc. cit.) study was 1·40 g. per man, and 1·21 g. per woman. Tigerstedt's (loc. cit.) Finnish diets showed an intake ranging from 1·18 g. for 2–3 years old children up to 4·33 g. for men. Sherman and Gillett's (loc. cit. 1917 study gave an average intake of 1·52 g. The present study shows a mean of 1·70 g. in the combined towns, which individually range from 1·44 g. (Dundee) up to 2·14 g. (Peterhead, which has the highest mean calorie and protein intake). Sherman indicates the minimum requirement in phosphorus to be 0·88 g. daily which with the 50 per cent. safety margin becomes 1·32 g. In this Scottish study 14, or 2·3 per cent., fall below 0·90 g. and 140, or 23 per cent., below 1·35 g.

Iron.—There is very little definite information in the literature on the requirements of men for iron or on the amounts actually consumed. Horneman (loc. cit.) found consumption to be 54·67 mg. for a man, 31·82 mg. for a woman, 18·76 mg. for a 6 year old child. Sherman and Gillett (loc. cit.) found the intake to range from an average of 12·1 mg. in the cheaper diets to one of 20·6 mg. in the more expensive, giving an average for the 92 households of 16·3 mg. In the present study the average of the combined Scottish towns is 14·3 mg., ranging from 11·3 mg. in Dundee to 20·2 mg. in Peterhead.

Sherman from his own and other experimental data on iron elimination, concludes that 15 mg. daily is required. If we accept this figure as the standard, 61·6 per cent. of the 607 families must be regarded as receiving an insufficient amount of iron in the diet.

Table V. gives the number of households in which the consumption of calcium, phosphorus, and iron falls within the ranges indicated.

The horizontal lines are placed to give an indication of the optimum intake in so far as can be determined from the limited information available. It is seen that there is a large proportion of the households in which there is a definite shortage of one or more of these three nutrients. In the present state of our knowledge, however, it would be unsafe to draw any definite conclusions from these figures. It is to be regretted that we have not more information with regard both to the requirements and the consumption of these nutrients. This is obviously an aspect of

ıman nutrition on which more work is urgently eeded.

TABLE V.

Ca.		P.		Fe.	
Amount (g.).	Cases.	Amount (g.).	Cases.	Amount (g.).	Cases
				0·0030–0·0045	2
				0·0045–0·0060	10
				0·0060–0·0075	15
		0·600–0·750	4	0·0075–0·0090	53
		0·750–0·900	10	0·0090–0·0105	65
150–0·300	5	0·900–1·050	17	0·0105–0·0120	60
300–0·450	42	1·050–1·200	51	0·0120–0·0135	87
450–0·600	102	1·200–1·350	58	0·0135–0·1050	82
600–0·750	120	1·350–1·500	87	0·0150–0·0165	59
750–0·900	104	1·500–1·650	71	0·0165–0·0180	52
900–1·050	76	1·650–1·800	86	0·0180–0·0195	42
050–1·200	58	1·800–1·950	59	0·0195–0·0210	20
200–1·350	45	1·950–2·100	57	0·0210–0·0225	24
350–1·500	22	2·100–2·250	35	0·0225–0·0240	15
500–1·650	20	2·250–2·400	27	0·0240–0·0255	3
650–1·800	5	2·400–2·550	21	0·0255–0·0270	5
800–1·950	3	2·550–2·700	8	0·0270–0·0285	5
950–2·100	2	2·700–2·850	5	0·0285–0·0300	3
100–2·250	2	2·850–3·000	2	0·0300–0·0315	2
250–2·400	1	3·000–3·150	4	0·0315–0·0330	2
		3·150–3·300	—	0·0330–0·0345	1
		3·300–3·450	4		
		3·450–3·600	1		
	607		607		607

Diets in Relation to Growth.

The standards referred to above have been fixed the requirements of adults whose needs are only ose of maintenance—i.e., the amounts of the fferent dietary constituents for replacement of the ss in "tear and wear" of the tissues. In addition this maintenance requirement, children need aterial for the construction of new tissues in growth. nfortunately, less work has been done on the growth quirement of children than upon the maintenance quirements of adults, though from the point of view health the former is probably the more important. 'e are indebted for whatever information we have iefly to Sherman and his co-workers.

Sherman and Hawley, as the result of balance periments with children, estimated that children om 3 to 13 years of age need 1 g. of calcium and om 1·16 to 1·46 g. of phosphorus per day. Sherman so considers that the need of the child for iron is eater proportionately than that of the adult. ı accordance with these findings, Hawley [23] has awn up the following scale of man values for otein and mineral requirements.

Hawley's Scale for Protein and Mineral Requirements.

an	18 to 60	1·0	Girl 13 to 14	1·3
oman	,, ...	0·8	,, 10 to 12	1·2
outh	15 to 17	1·5	Child 6 to 9	1·0
rl	,, ...	1·2	,, under 6	0·8
oy	10 to 14	1·3		

To ascertain the average consumption on this growth quirement scale the man value for Dundee was calculated on the Hawley standard. On this andard the mean man value was 7·19 as compared ith 5·46 on Cathcart's standard. The average otein and mineral consumption in Dundee on the vo scales is given below.

Comparing Cathcart's scale on which the man value calculated on an energy requirement basis with that Hawley on which it is calculated on the require-ents of growth, it is seen that on the latter basis ıe diet provides roughly nearly 25 per cent. less of protein, calcium, phosphorus, and iron per man unit.

—	Cathcart's scale, based on energy requirements.	Hawley's scale, based on requirements for growth.
Protein (g.)	97·90	74·77
Calcium (g.)	0·70	0·53
Phosphorus (g.) ..	1·44	1·101
Iron (g.)	0·0113	0·0087

We have seen that calculating the intake according to Cathcart's scale the number of families which fall below the standards for these substances was 41·7, 24·5, 23·0, and 61·6 per cent. respectively. On the Hawley scale these numbers would, of course, be greatly increased. This is brought out in Table VI., in which the diets are calculated on the basis of this scale.

TABLE VI.—*Range on Hawley Scale (Dundee).*

Protein.		Calcium.		Phosphorus.		Iron.	
Amount (g.).	Cases.	Amount (g.).	Cases.	Amount (g.).	Cases.	Amount (g.).	Cases.
						0·0030–0·0045	1
						0·0045–0·0060	1
40– 50	1					0·0060–0·0075	8
50– 60	2			0·600–0·750	1	0·0075–0·0090	14
60– 70	13			0·750–0·900	4	0·0090–0·0105	9
70– 80	8	0·150–0·300	1	0·900–1·050	10	0·0105–0·0120	2
80– 90	8	0·300–0·450	7	1·050–1·200	11	0·0120–0·0135	1
90–100	4	0·450–0·600	20	1·200–1·350	9	0·0135–0·0150	1
100–110	1	0·600–0·750	7	1·350–1·500		0·0150–0·0165	
110–120		0·750–0·900	1	1·500–1·650	1	0·0165–0·0180	
		0·900–1·050	1	1·650–1·800	1		
	37		37		37		37

From the table it is seen that out of 37 families only one had over 100 g. of protein; nine over 0·6 g. of calcium; two over 1·35 g. of phosphorus, and none over 0·015 g. of iron, the standard requirements according to Sherman. On the whole the average intake of these substances is lower in Dundee than the average for the whole seven towns. This city has the lowest average for phosphorus, lowest average for iron, and third lowest for calcium. The percentage of families receiving less than the standard requirements would not be so high in the other towns. Even allowing for this however, a superficial examination of Table V. in the light of Table VI. shows that probably the majority of families in all the towns are on diets with less than the optimum amounts of protein and these three minerals.

The only other dietary survey carried out under comparable conditions and calculated to this scale is that of McKay (loc. cit.) for 47 families in Ohio. The average consumption as found by McKay is compared with the average consumption in the present survey in the following figures:—

—	Ohio.	Scottish Towns.
	Average.	
Calories	3587	3609
Protein	92·9 g.	74·77 g.
Calcium	1·087 g.	0·532 g.
Phosphorus ..	1·594 g.	1·101 g.
Iron	0·0163 g.	0·0087 g.

The difference between the composition of the diet in Ohio and in these Scottish diets is striking. The former is wholly adequate for growth with regard to

the constituents named. Compared with the average Ohio diet the Scottish diet, while rich enough in energy-yielding constituents, contained only from one-half to two-thirds as much of these nutrients required as constructive material in growth.

Discussion of Results.

In the milk tests on school-children, in connexion with which the present survey was made, more than one-third of the children came from the households studied in the present survey, and these households were chosen as representative of the homes of all the children. It is of interest, therefore, to consider the results of the milk tests in the light of the results of the survey. In the tests it was found that the giving of extra milk was followed by increased rate of growth, as determined by both increased height and increased weight. The increase was from 20–40 per cent. in each of three groups of different ages in the whole of the seven cities and towns. Separated and whole milk were found to be of practically the same value for growth for school-children. On the other hand, the addition of carbohydrate and fat-rich biscuits had no effect on growth. The finding that the additional fat and carbohydrate given in the biscuits had no definite effect, combined with the finding that the whole milk, including the fat, had little or no greater effect than the separated milk without the fat, could only be explained on the grounds that the caloric intake of the children was on the whole sufficient for their needs. This is in agreement with the results obtained in the dietary survey.

Factors common to both separated milk and whole milk are proteins and minerals. The survey shows that a large proportion of the diets had less than the amounts of protein, calcium, phosphorus, and iron necessary to maintain optimum growth. It seems probable, therefore, that at least some of the effects of the separated milk can be attributed to the protein and minerals.

The results of the survey seem to indicate that there is a shortage of calcium, phosphorus, and iron in many of the urban diets. Our information with regard to the requirements of these is, however, very inadequate. Further, there are very little data with which those of the present survey can be compared. It would be unsafe, therefore, to draw any far-reaching conclusion from the results of the present survey. They are, however, of sufficient interest to warrant the suggestion that more information is urgently needed both on the requirements for those nutrients and on the intake.

No attempt was made to assess the vitamin value of the diets. The omission is due, not to lack of appreciation of their importance, but to the fact that in the present state of our knowledge neither the vitamin content of the foodstuffs nor the vitamin requirements of individuals at different ages can be expressed in units suitable for statistical treatment. It is more than probable, however, that there may be a deficiency of some of the vitamins especially, in view of the results obtained with milk, of those concerned with calcium assimilation and with growth.

If the tentative conclusions of the survey can be regarded as even approximately accurate, it is evident that the dietaries of these urban households would be greatly improved by an increased consumption of milk and green vegetables. Milk is the best and cheapest source of protein and calcium. It is also rich in phosphorus. Green vegetables are rich in both calcium and iron. In addition to these nutrients milk and vegetables would also enrich the diet in those vitamins liable to be lacking in a carbohydrate-rich diet.

Summary.

The main points brought out by the statistic analysis of the diet are as follows:

(1) In 607 families in seven Scottish towns th average diet, taken as the amount of edible materi entering the house and calculated on Cathcart standard of man values, was found to have a calor value of 3609, with 107·8 g. protein, 574·4 g. carb hydrate, and 86·1 g. fat per man value.

(2) The mineral content of the diets was als estimated using the same man value scale. Th showed an average amount per man of 0·86 g. calciun 1·70 g. phosphorus, and 0·0143 g. iron.

(3) Of the 607 families the following percentag were found to be below the generally accepte standards of requirement for adults for the foo constituents dealt with; protein, 41·7 per cent. fat, 13·3 per cent.; calcium, 24·5 per cent.; phosphoru 23·0 per cent.; and iron, 61·6 per cent.

(4) The diets for one town (Dundee) were r calculated on the Hawley higher man value scal which takes into account the requirements in protei and minerals for growth in children. The averag amount per man value on this scale was found to be protein, 74·77 g.; calcium, 0·53 g.; phosphorus, 1·101 g and iron, 0·0087 g.

(5) In this town the standards of intake necessar for optimum growth were reached in the case of th 37 families studied in only one case for protein, nin cases for calcium, two cases for phosphorus, and nor for iron.

(6) The results of the survey indicate that th diets are, on the whole, adequate as regards the energy value. Comparatively few fall below th minimum necessary for health. Only 29 out of th 607 families are below 2500 calories, which is sufficien for a man not doing manual labour. Only tw families fall below 2000 calories. There is thus n indication of any extensive gross under-nutrition.

(7) When the diets are considered from the point view of their adequacy to support optimum growt the results are less satisfactory. The diets are po in protein and poorer still in the minerals estimate According to Sherman's standard of requiremen the great majority of the diets are incapable supporting the optimum rate of growth.

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TUBERCULOSIS SCHOLARSHIP TOUR.

(FROM OUR OWN CORRESPONDENT.)

Two years ago a party of Canadian medical men nd women visited this country to make a study of berculosis work, and a return visit was paid last onth by a group of 50 British medical men and omen. The itinerary was planned by Dr. W. E. odehouse, secretary of the Canadian Tuberculosis ssociation, and both tours were made possible by e offer of scholarships from the Sun Life Assurance mpany of Canada.

QUEBEC AND MONTREAL.

The s.s. *Duchess of Bedford* was due to arrive at Quebec rly on the morning of Friday, August 15th, but as delayed by fog until the evening, and the proamme for the day had to be cut out, save for a ry late dinner at the Château Frontenac, given by e Provincial Government. Montreal was reached xt day, and on Sunday the real business of the ur began with an inspection of the Sacred Heart spital, Cartierville. This is a magnificent building anned, organised, and owned by a Roman Catholic terhood, but with an independent medical staff tached to the Montreal General Hospital. The ernoon programme included a visit to the country tate of Mr. T. B. Macaulay (President of the Sun fe Assurance Company) and an inspection of his nderful herd of Frisian cattle which have had a gative tuberculin test for seven years. The cterial count of the milk is now almost nil.

OTTAWA.

At Ottawa next day an inspection of Parliament uildings was followed by a visit to the Research aboratories of the Health of Animals Branch, deral Department of Agriculture. Here four short tures were given. Dr. A. E. Cameron outlined e methods adopted for the control and eradication bovine tuberculosis in Canada; Drs. Hoefflin d Stanley gave a study of the blood picture in vine tuberculosis; Drs. McIntosh, Watson, and nst gave a comparative study of vaccination with ing tubercle bacilli, with especial reference to C G; and Dr. C. A. Mitchell a comparative study the biology and pathogenicity of tubercle bacilli avian, bovine, and human origin. The next visit s to the Royal Ottawa Sanatorium, a well-equipped d up-to-date institution, the cost of which is borne the city, aided by a grant from the province of tario. A brief visit to the Civic Hospital, which s a few beds for tuberculous patients, a tour of the y, and dinner at the Château Laurier as guests of e City of Ottawa, completed the second day.

TORONTO.

Toronto was reached on Tuesday morning when a thological demonstration was staged at the Hospital Sick Children by Dr. H. C. Parsons, physician in ief, and Dr. Erb, pathologist to the hospital. Dr. Erb showed a number of post-mortem specimens from children dying from tuberculous meningitis and miliary tuberculosis. The specimens showed a small primary focus in the lung with corresponding lesions in glands draining that portion of the lung. A second group of cases illustrated the point that as the disease progresses and the mediastinal glands enlarge, the mediastinum takes on the appearance of a large tumour. The third group illustrated certain types of accident that may occur in persons with mediastinal tuberculosis—e.g., caseous glands breaking down into a bronchus, with resulting fatal aspiration, pneumonia, thrombus in the right pulmonary artery, &c. Dr. Parsons said that the Chest Clinic was started with a view to ascertaining how much tuberculosis was communicated to children by adults. They also wished to find out the way in which early tuberculosis started. They had become convinced that the main feature was mediastinal in the early stages rather than pulmonary. Practically all the tuberculosis in Toronto was of human type. The material in the hospital was definitely selected, the chest clinic automatically getting all the contacts immediately, also all children from school clinics suspected of tuberculosis. Children with positive tuberculin tests and no clinical or physical signs are believed to be invariably suffering from tracheobronchial tuberculosis. Prof. Schick in a recent visit to the hospital concurred in this view.

A visit to the diagnostic clinic at the Gage Institute, of which Dr. W. J. Dobbie is the physician in chief, was the next item. At this clinic 65,550 persons have been examined, the average number at present being 500 per month. Nearly all these patients are sent by physicians in Toronto and from within a radius of 50 miles of the city. No treatment whatever is given at the clinic. Dr. Dobbie is also physician in chief of the Toronto Hospital for Consumption which has a daily average number of 350 patients in residence. This was the first hospital for advanced cases of tuberculosis established anywhere in the world. Another institute visited was the Christie Street Hospital, containing about 350 beds, which is maintained by the Federal Department of Pensions and National Health for ex-Service men. A visit to the Connaught Laboratories and School of Hygiene in connexion with the University of Toronto was arranged for the remainder of the afternoon. In these laboratories research is carried out in various fields of preventive medicine, and biological products—diphtheria and tetanus antitoxins, liver extract, insulin, &c.—are prepared. The day finished with a dinner given by the Provincial Government of Ontario to the members of the tuberculosis party.

On Wednesday a demonstration was given by Dr. G. C. Brink, of the Travelling Clinic, for the diagnosis of diseases of the lungs, of which the Government bear the whole cost. The staff of the clinic consists of from one to three physicians and a nurse. The equipment includes a portable X ray unit, and X ray films are taken of every case. Tuberculin tests are done on all children under 16 years of age.

A short inspection of Hart House, the well-equipped non-residential quarters of the University Students' Union, was followed by a visit to the Children's Preventorium. This was opened in 1910 with 100 beds for tuberculin-reacting contacts of sputum positive cases in the city. No definite cases of pulmonary tuberculosis and no surgical cases are admitted. The duration of stay is up to nine months, but may be indefinitely prolonged where the home conditions are bad.

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BALA.

A night journey to Bala enabled the party to board the steamship *Cherokee* in time for breakfast. Two or three hours were spent on Lake Muskoka, winding in and out of the hundreds of thickly wooded islands, till Calydor Sanatorium was reached. This very beautiful hospital, of which Dr. Parfitt is physician in chief, was established 14 years ago for private patients. Two types of patient are received here: those who come for diagnosis and only make a short stay, and those who are very ill and stay on for indefinite periods to get well. When the tour of the sanatorium was completed the members of the Beaumaris Yacht Club kindly took the whole party for a delightful trip on the lake in a number of motor boats, and afterwards entertained their guests at lunch. A move was then made to the Muskoka Cottage Sanatorium for private patients, the first sanatorium in Canada, opened in 1896. Both this institution and the Muskoka Hospital for Consumptives are under the care of Dr. W. B. Kendall, and both were intended at first only for incipient or early cases of tuberculosis. At present, however, moderately advanced and advanced cases form an overwhelming majority of the patients. Both these institutions appear to be ideal for their purpose in regard to climate, situation, amenities, design, equipment, and medical care available.

After dinner at the Muskoka Hospital the steamer was boarded for the return trip across Muskoka Lake, the party entraining late that night at Bala for the long railway journey to Ninette, Manitoba, where the week-end is to be spent as the guests of the Manitoba Sanatorium Board. On Monday afternoon the party will entrain for Winnipeg, where the British Medical Association meeting is to be held. At the end of the meeting the party will leave for Chicago and other cities in the United States. The tour ends officially on Sept. 5th, but many individual members are planning to extend it.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

MEDICAL ADVERTISING BY GROUPS.

THE success of public health advertising by county medical societies in New York, Ohio, and elsewhere is resulting in a new crop of experimental advertising campaigns. The movement has reached the State of Washington on the west coast, and 80 members of the Pierce County Medical Society have subscribed $4500 for use in their locality. An advertising agency in Seattle is acting as consultant, but all published articles are passed upon by a committee of the society. The advertising "messages" appear in the first place in the three county newspapers, then each is reprinted in leaflet form for distribution by the doctors to their patients. Finally they are bound together with a roster of the county medical society, and presented to the public libraries and schools.

"The articles," it is stated, "will make known essential facts in the progress of medical science, the real work and aims of the organised medical profession, and its every-day relation to all classes of people. The qualifications demanded of the competent physician to-day, and the standards by which he is identified may be indicated. It is believed that this work will result in a broader knowledge of public health and assist materially in the prevention of disease; and it is for these reasons that the educatio campaign has been undertaken."

IMMUNOLOGY OF SCARLET FEVER.

The use of scarlet fever streptococcal toxin and corresponding antitoxin for the prevention and tre ment respectively of scarlet fever was discussed the annual conference of State and territorial hea officers with the U.S. Public Health Service. T conference was reminded by Dr. M. V. Veldee t four years ago they had come to the follow conclusions: (1) The intradermal reaction to scar fever streptococcus toxin is a fairly depend measure of the susceptibility of the individual test (2) The majority of the individuals giving a posit reaction can be effectively immunised by the pro use of scarlet fever streptococcus toxin. (3) T use of scarlet fever streptococcus antitoxin, either passive immunisation or for the treatment of individual ill with scarlet fever, is not yet founded sufficient clinical data to permit a mature opinion to the efficacy of this form of treatment. The la amount of research since that time had given lit reason, he believed, to alter these conclusio Probably 90 to 100 per cent. of persons giving Dick-positive reaction can be converted to Di negative reactors by the injection of scarlet fe streptococcus toxin. The effect that such prophyla may have on the incidence of scarlet fever in a la community cannot at present be stated, tho encouraging statistics are reported in the *Journal Infectious Diseases* by Toyoda [1] and his co-work in Manchuria. There are also certain practi difficulties of administration which retard the adopt of this method of prophylaxis. Dr. Veldee refer especially to the uncertainty existing as to the num of injections to be given, and the disadvantages giving many injections of a solution relatively high protein content. He felt that we need a prod which will be satisfactory with fewer doses, and give rise to less reaction.

TOXIN-ANTITOXIN AND TOXOID.

At the same conference Dr. W. T. Harrison repor a study made at the National Institute of Hea (formerly the Hygienic Laboratory) on the comparat merits of toxin-antitoxin and toxoid. Tests w made on comparable groups of children under stric controlled conditions. Schick tests were given bef and at a stated interval after immunisation. T test in children who received toxin-antitoxin v controlled with heated toxin, that in the child who received toxoid by toxoid diluted in 1 in physiological saline solution. Various commer samples were used, and one sample of toxin-antito prepared in the laboratory of the institute. Diphthe toxoid was found to be "practically an ideal agen both on account of the complete absence of local general reactions, and the very high percentage successful immunisations following two injectio The injections, of 1·0 c.cm. each, were given at interval of one month. In 475 children immuni as measured by the Schick test, was conferred 95 per cent. of cases. In the group receiving tox antitoxin, only 64 per cent. were successfu immunised.

APPENDICITIS.

In its July bulletin, the Metropolitan Life Insura Company draws attention to the large and increas number of deaths from appendicitis. More t 18,000 deaths were recorded from this cause in United States in 1928. The increase is believed to

real one, and not due in any large degree to greater ecision in the filling out of death certificates. general health examinations in recent years, tween 2 and 3 per cent. of males have shown nderness in the appendix region. It is suggested at critical research is needed to uncover the causes ding up to inflammation of the appendix.

"JAKE" PARALYSIS.

A preliminary communication from the National alth Institute[2] announces that the mystery of ake" paralysis is solved. The poison is a phosoric acid ester of one of the cresols. An adulterated ger made up from the U.S. Pharmacopœia fluid tract but containing 2·7 per cent. of tricresyl osphate (technical) gives all the effects in rabbits l monkeys that samples of suspected Jamaica ger had given. The rabbits were poisoned, the nkeys escaped. The isolation of this phenol npound was greatly assisted by the bureau of hibition who were able to supply large quantities seized Jamaica ginger, some of which was known to ong to batches which had caused poisoning. It nteresting that the ester is apparently not broken vn by dogs or monkeys, and large doses can be en by them without injury. Rabbits suffer from nol poisoning. Calves also suffer with a type paralysis more closely simulating that found in man.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

INCREASE OF HEART DISEASE.

Prof. Leschke of the Charité Hospital, Berlin, lately been commenting on the great increase heart diseases. Whereas the death-rate from this se was 161 per 100,000 in 1911 it had increased 189 in 1927. This is the more remarkable because general mortality decreased considerably during same period. Every form of heart disease has reased with the exception of pericarditis, while ditions due to rheumatic, bacterial, or syphilitic ction and to overstrain of the heart and vessels e become a great deal more common. During the , and immediately after it when influenza was ecially severe, endocarditis and myocarditis as a uel to streptococcal infection were responsible a large number of deaths. In Leschke's opinion increase of syphilitic affections of the heart and vessels is not a result of salvarsan therapy, as has n suggested. Of his own cases 88 per cent. had been treated by salvarsan at all. On the other d the beneficial action of salvarsan will not be ious for some years, since the interval between ction and the development of syphilitic aortitis usually between 6 and 40 years. Economic iculties, the struggle for existence, and the uence of tobacco, spirits and strong coffee, are ong the factors he holds responsible for heart ase and he advocates individual prophylaxis inst circulatory fatigue. An advantageous uence is the tendency of the younger generation bstain from spirits and tobacco and to indulge in ies and sound athletic exercise.

The increase of thrombosis and embolism is sometes attributed to the increase of intravenous injections, but the majority of sufferers have not received any such injection.

POLIOMYELITIS IN GERMANY.

Infantile paralysis has become prevalent in several parts of southern Germany, especially in Baden. The source of infection is obviously Alsace, where it is said to have been common for some time. From Baden it has spread over northern Germany and up to August 16th, 510 cases had been notified in the country as a whole. Notification is compulsory and in some of the German states the health authorities must be informed if the diagnosis is so much as suspected. According to a Prussian law patients suffering from, or suspected of suffering from, poliomyelitis must be isolated; the rooms must be disinfected and child contacts are not admitted to school. In a Berlin grammar school and in certain municipal schools there have been some fatal cases and some of the classrooms have been provisionally closed. Parents whose children are attending these schools are somewhat nervous, and this has led the Municipal Health Office to make an official statement that the spread of the disease is comparatively slow and that the danger of catching it is much smaller than in scarlatina, diphtheria or measles.

A LARGE INFANT.

Dr. Kötter, writing to the *Centralblatt für Gynäkologie* describes the birth of a child 6284 g. (about 13¾ lb.) in weight and 61 cm. long. The infant was born spontaneously and labour was fairly quick, the only difficulty being that the passage of the shoulders was delayed in the pelvis. Living infants of 6000 to 7000 g. are very rare; indeed only five cases are described in medical literature. The causes of the gigantism are not fully understood; troubles of internal secretion, superabundant nourishment, diabetes, racial or constitutional pecularities of the parents, and an abnormally quick growth of the fœtus have all been put forward as responsible.

KALLIKREIN.

Dr. Frey has reported to the Berlin Medical Society on a hormone obtained from the pancreas which exerts, he says, a powerful influence over the circulation by dilating the blood vessels. The new hormone is present in urine and disappears therefrom if the pancreas is removed. It is produced commercially under the name of Kallikrein by the Farbwerke factory and this preparation is administered by intramuscular injection. It is said to lower high blood pressure considerably, but leaves normal pressure unaffected. Low blood pressure may even slowly increase, which suggests that the hormone has a regulating action. In the treatment of angina pectoris the attacks are said to have ceased rapidly. Frey drew special attention to the excellent effects noted in intermittent claudication; in cases of early gangrene and necrosis amputation could be avoided by giving kallikrein. In the discussion of his paper good results secured in several hospitals were reported by other speakers.

A MEDICO-LEGAL QUESTION.

A remarkable judgment was recently given by the High Court in Leipzig. A patient telephoned to a medical man (Dr. A.) asking him to see her. The doctor's wife replied that he would come at once, but in her husband's absence she sent a locum tenent to the patient. The treatment given by the latter proved unsatisfactory and the patient eventually brought

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BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN WINNIPEG.

(*Continued from p. 542.*)

SECTIONS OF SURGERY AND TUBERCULOSIS.

AT a joint meeting of the Sections of Surgery and Tuberculosis Prof. E. W. ARCHIBALD (Montreal) opened a discussion with a paper on the scope of

Thoracic Surgery.

This was, he said, the latest of the specialties, and hitherto the best work in it had been done by general surgeons who had made it their hobby. Eventually, however, he believed that surgeons would devote their time exclusively to this one branch of surgery. Team-work was a necessity, and was now almost the rule wherever real progress was made. In his own thoracic clinic, surgeons, physicians, and pathologists worked together in close collaboration and free discussion always preceded surgical measures.

Discussing indications for treatment, Prof. Archibald said that operation should not be attempted in a tuberculous patient unless there was evidence of resistance, as shown by fibrosis or scar tissue. He divided patients into three classes: (1) "good chronics" or favourable cases; (2) conditionally favourable cases; and (3) unconditionally unfavourable cases—i.e., those with cavities or mixed infections. In his own series the operative mortality in class 1 was 3·5 per cent.; in class 2 3·6 per cent.; in class 3 28·5 per cent. The mortality thus varied directly with the class of case, so that very careful selection was required. With regard to lung abscess, two things were worth noting: first, that sometimes in the past too much had been done for such cases, since 40 per cent. of them would cure themselves if left alone; secondly, that sometimes in the past too little had been done for chronic cases. Cases of bronchiectasis could be divided into two groups: (1) the simple or uncomplicated, for which artificial pneumothorax or phrenicotomy was suitable; and (2) the complicated with chronic suppuration accompanied by parenchymatous infiltration, for which either a one-stage or a multiple stage lobectomy was indicated. The results of a one-stage lobectomy were so encouraging that this operation would probably be the rule in cases of unilobar disease.

(*Continued from previous page.*)

an action for damages against the medical man and the locum tenent. The High Court found for the plaintiff and held that not only the locum tenent but also Dr. A. was responsible; the patient had desired that Dr. A. should attend her, and from his wife's answer had concluded that this would be so. Although Dr. A. was prevented from coming the patient had made the agreement for medical attendance with him and therefore he and his locum tenent were liable to pay damages. This was the more apparent as the bill for medical attendance was sent to the patient by Dr. A.

On another judgment the High Court has decided that if the wife of a medical man, as may happen in country practice, gives first-aid to a patient in her husband's absence, she alone is responsible for any mistake she makes. But if the medical man sends a bill to the patient he becomes responsible, for his wife is then to be regarded as his unqualified assistant.

THE MEDICAL ASPECT.

Dr. R. A. YOUNG (London) thought the help th surgery could give, in those grave intrathorac conditions where medicine was impotent or limit to palliation, was not as widely recognised as should be—thoracic surgery was, indeed, daily givi results comparable in value with those of abdomir surgery and without prohibitive risks. The medic aspects of this development were difficult to defi They involved: (1) diagnosis of the condition; (assessment of the patient's suitability for operatio (3) choice of surgeon; and (4) discussion of t operative measures proposed and their adaptati to the needs of the patient. The diagnosis of int thoracic disease, especially of morbid conditions the bases of the lungs or of the mediastinum, mig be very difficult, but fortunately there was usual time for the full investigation which was necessar The advance in radiological technique had contribut largely to the advance in diagnosis and surgi treatment of intrathoracic disease, and comple radioscopic and radiographic investigations were n essential in almost every case. As a physici Dr. Young deprecated exploratory puncture random where intrapulmonary suppuration w suspected. It might be a cause of disaster if t pleura in the region of the puncture was not adhere It was a still more difficult matter to assess t patient's suitability for operation, depending as did on so many imponderable factors. Urologi had set physicians an excellent example in the hi standard of their methods of investigating re function before operation, and the speaker felt th there was scope for research in the matter of asse ment of respiratory efficiency. A very low vi capacity might be a bar to operation. At present was necessary to rely chiefly on a careful clini review. Dr. Young felt strongly that the m difficult operations in that field of surgery should o be entrusted to those with special experien Fortunately there were now teaching centres in alm all English-speaking countries where thoracic surg of the best type could be studied and where experie could be gained. Preparation for operation sho include prolonged preliminary measures for gett the patient into the best possible condition, and provision of skilled after-care and nursing.

MALIGNANT DISEASE OF THE LUNG.

Mr. A. TUDOR EDWARDS (London) said that whet or not there had been a true increase in the incide of malignant disease in the lung during the last f years, the incidence of cases diagnosed was certai much higher than it was even five or six years a Primary malignant neoplasms in the chest w extremely insidious in their onset, and by the ti the patient sought advice the mediastinal glands l usually become involved and all hopes of succes surgical removal of the growth had gone. In lung, carcinoma apparently arose primarily in t situations—the bronchi and the parenchyma. P monary endothelioma of the lung had been describ the growth being localised to a greater or less deg and consisting of masses of cells of endothelioid ty Sarcomata were much rarer than used to be thoug and many cases formerly described as sarcoma wo now be classified as carcinoma.

Symptoms and signs.—Although the onset generally gradual and insidious, many cases star with a pyrexial attack commonly labelled influe Sometimes the history might merely be one increasing lassitude without localising symptoms, symptom being later accompanied by dyspnœa

n-productive cough. Hæmoptysis occasionally peared early. Irregular pyrexia might also be an rly symptom, but the temperature was rarely high til the later stages of the disease. Pain was never vere until the pleura or mediastinum was involved. her possible symptoms included dysphagia from essure upon the œsophagus of secondary deposits mediastinal glands, and hoarseness from pressure on or involvement of the left recurrent laryngeal rve. The signs varied according to the type of sease. In the central or alveolar type physical gns might be altogether absent or might consist of alised dullness associated with weakened breath d voice sounds. Extrapulmonary signs included largement of the supraclavicular gland and ralysis of the homolateral diaphragm from phrenic rve involvement. Evidence of venous obstruction as comparatively rare in pulmonary neoplasms. æmorrhagic pleural effusions might occur, these ing usually late in their incidence.

Diagnosis.—The possibility of malignant disease ould be suggested by the fact that the signs were t typical of any of the common lung diseases, e diagnosis being further confirmed by physical, diological, and laboratory examination. Broncho-py should be undertaken wherever there was finite evidence of bronchial obstruction, as well as patients in whom hæmoptysis was a prominent mptom but in whose sputum no specific organisms uld be found on repeated search. Mr. Edwards so urged the removal of a small portion of suspected sue for histological examination. Thoracoscopy ght be of value in a limited number of cases, lowing the production of an artificial pneumo-orax or the replacement of an effusion. In cases ere the growth was superficial a definite diagnosis ght be made by this means. Exploratory thoraco-my also had a definite place among diagnostic thods. When it was carried out under modern nditions and, where possible, preceded by the duction of artificial pneumothorax, exploratory oracotomy was no more serious a procedure than dominal operation, and entailed usually less opera-ve discomfort to the patient. Intercostal incision th retraction of the adjoining ribs gave sufficient posure, rendering rib resection unnecessary except older subjects in whom the costal cartilages were ified, or when the actual removal of neoplasms or large portions of lung was contemplated.

Treatment.—Until recently no definite attempt had en made, apart from the various forms of radio-erapy, to treat malignant disease of the lung in an equate way. Owing both to the insidious onset the disease and also to the position of new growths the lung in relation to vital structures, there were vious difficulties in the way both of complete noval or of adequate irradiation of pulmonary oplasms. Cases of malignant disease arising in the all alveoli or small bronchioles, which, however, fortunately formed only a small proportion of the al cases of malignant disease of the lung, offered best chance of surgical extirpation. Bronchial cinoma rarely offered any hope of successful noval owing to the position of the growth and its ly spread into mediastinal glands.

Where radical removal of malignant growths in lung was impracticable, radium therapy should considered. Three methods were available—etherapy, external plaques, and radon seeds. Tele-erapy—the application at a distance of large doses a bomb—was painless and therefore an attractive thod, but the six patients whom he had treated this method alone had all died. The application of radium on external plaques of Columbia paste or Sorbo rubber had been used for five cases of malignant disease in the lung without, however, any improvement, save that in three cases the application had considerably relieved acute pain caused by the involvement of the chest wall by the growth. The insertion of radon seeds was another method which had definite advantages over the use of radium needles in the treatment of pulmonary growths. Even when cure was not likely, the relief given and the prolongation of life afforded by means of radium thoroughly justified the comparatively small risk entailed. Deep X ray therapy, on the other hand, was very disappointing for primary malignant lung tumours. He had never seen a patient who had benefited thereby, but the newer and more powerful types of apparatus might prove of more value.

PHRENIC NERVE AVULSION.

Dr. W. L. MANN (Winnipeg) said that collapse therapy was a natural means of curing of many lung lesions. Within a few years of the introduction of artificial pneumothorax, the first operation on the chest wall to produce collapse was done, but it was not till 1911 that paralysis of the diaphragm was suggested as an aid to collapse therapy. Dr. Mann traced the gradual improvement of the technique from the early simple section of the nerve to the realisation of the very great variation in the mode of formation of the phrenic nerve, and of the fact that a single trunk could not be assumed until well below the clavicle. Avulsion of at least 4 inches of the nerve was now the operation of choice. Discussing the signs of paralysis of the diaphragm, the speaker pointed out that the extent of the rise varied from 2 to 13 cm. and was dependent upon several factors, the most important of which was the type of lesion in the lung above. If the lesion was markedly proliferative, the diaphragmatic rise was usually great. The chief value of this paralysis was that it removed one of the forces opposing the natural healing process within the lung—i.e., the contraction of scar tissue. The paralysed diaphragm allowed collapse of scar tissue and tended to produce obliteration of cavities; it allowed a reduction in pulmonary volume varying from one-sixth to one-third; it produced a degree of pulmonary rest by removing the piston-like action of that half of the diaphragm. This affected chiefly the lower lobe, but to some extent also the whole lung. Cough and expectoration were often much easier than before. Hæmoptysis often ceased immediately after the operation; sputum might be markedly reduced in a month, cavities gradually obliterated, and general improvement in health frequently occurred. Possible dangers connected with the operation included hæmorrhage from accidental injury to the blood-vessels; air embolism following wounds of the large veins of the neck; mediastinitis, set up by drawing out the nerve through infected pleura and lung. The commoner indications for phrenic avulsion included such conditions as pulmonary or pleural cavitation, as in chronic empyema which had resisted other methods of treatment and where thoracoplasty was indicated. In bronchiectasis phrenic avulsion might be tried with or without pneumothorax. If lobectomy had been decided upon, the preliminary phrenic evulsion was of valuable assistance. The commonest indication for the operation was in the treatment of pulmonary tuberculosis, either in acute progressive cases where pneumothorax was not possible and thoracoplasty inadvisable, or as a supplementary measure in cases of incomplete pneumothorax; or,

again, in many chronic cases with cavitation and positive sputum a phrenic avulsion might allow cavities to close and symptoms to disappear. In cases of pulmonary hæmorrhage when pneumothorax was impracticable, diaphragmatic paralysis might be of great value. Avulsion should also be done as a preliminary to every thoracoplasty. While sufficient time had not yet elapsed in most of his cases to allow of a detailed analysis of the results, Dr. Mann was satisfied that it was a very valuable aid in the treatment of lung lesions requiring collapse therapy, its greatest use being in certain types of pulmonary fibrosis.

CLOSED DRAINAGE OF EMPYEMA.

Dr. J. D. McEACHERN followed with a paper on Closed Drainage in the Treatment of Empyema, including a report on 42 acute cases in infancy and childhood. The principles of modern treatment in this disease were: delay in operation, empyema not being looked upon as a surgical emergency; irrigation with Dakin's solution; and the application of negative pressure to assist in expanding the lung and thus obliterate the cavity. The closed method was slow in coming into general use, but after a personal experience in more than 50 cases Dr. McEachern had found this method so much better that he had abandoned the open method. The ages of his 42 patients ranged from 4 months to 11 years. One death occurred in the series, that of a child 14 months of age, who developed empyema after broncho-pneumonia. There was also one case of pleural shock during irrigation of the cavity by an inexperienced nurse. Except for two cases of pocketing, no case required secondary operation. The advantages of the closed over the open method were: (*a*) lessened mortality, attributed to the avoidance of general anæsthesia, the lessening both of surgical trauma and the danger of secondary infection; (*b*) lessened morbidity, the period of illness being reduced from an average of six weeks under the open method to 25 days. Another great advantage was the avoidance of the usual painful daily dressing.

PULMONARY LOBECTOMY.

The last paper of the session was contributed by Dr. N. S. SHENSTONE (Toronto) and Dr. R. M. JANES (Toronto) on Experiences in Pulmonary Lobectomy. This was based on seven cases in which one or more lobes of the lung had been removed for bronchiectasis —all of them having previously been treated for a long time by less drastic methods. No case was considered suitable for transfer to the surgical wards until lipiodol injections had, as far as possible, excluded bilateral or extensive multilobular disease. In each case the diaphragm was paralysed a few days before the major operation was undertaken. The technique adopted was modified from that originally described by Dr. Harold Brunn in his paper on One-stage Lobectomy. The reaction following operation was usually surprisingly slight, and primary union occurred in all wounds except one.

DISCUSSION.

A short discussion of the papers followed. Sir STCLAIR THOMSON spoke of some of his early experiences as house surgeon to Lister. Dr. L. S. T. BURRELL mentioned two points in regard to phrenic avulsion which he had found useful. The procedure was valuable in the case of moving mediastinum during treatment by artificial pneumothorax. He had himself found phrenic avulsion more efficacious in preventing this than the introduction of oil. The other great indication of phrenic avulsion was in terminating a prolonged period of artificial pneum- thorax. Dr. H. C. PARSONS spoke of the treatme of bronchiectasis in the Hospital for Sick Childre Toronto, by lipiodol with bronchoscopy, and postural treatment. Lord MOYNIHAN support Prof. Archibald's plea for specialisation, but dr attention to the danger of premature specialisatic The craft of surgery, he said, was now complete, b the bounds of surgery had not yet been approache

Mr. TUDOR EDWARDS said that there had be considerable variation in the attempts made remove diseased portions of the lung. He thoug that Dr. Shenstone had apparently made the interv between the stages of operation too long, but in a case the one-stage operation would probably be t method of choice in the future.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

AT the first session of this Section the chair w taken by Prof. ROBERT MUIR (Glasgow), and discussion on the

Physiology and Pathology of Melanin

was opened by Prof. JAMES EWING (New York City Masson, he said, had brought evidence to show th melanomata were the result of a diseased conditi of the peripheral nervous system. His own observ tions had led him to agree with this contentio Examination of a deep subcutaneous nævus reveal the presence of special nævus cells, which appear to bear a similar relationship to the nerve-fibr entering the tumour as did the tactile corpuscles Paccini to the nerve-fibres of the skin. Nearer t epidermis there were also pigment cells, whi appeared to be derived from the nævus cells in t deeper layers. This structure led him to believe th the usual type of melanoma was essentially a tumo of nervous origin, and that the pigment was form not by epithelial cells, as was usually believed, b by cells that took origin in the peripheral nerv fibrils. It seemed that the pigment cells beca independent of the nævus cells, and were able certain circumstances to proliferate extensive In support of this he showed a lantern slide of tumour consisting purely of chromatophores; su tumours were met with in the dermis and in t epidermis as well as in the eye. In connexion wi the probable nervous origin of melanomata, it w interesting to note that nævi were frequently prese in cases of generalised neuro-fibromatosis, and th melanomata were not uncommonly of trauma origin. Although believing in the nervous origin nævi and melanomata, he would not go so far as rule out an epithelial origin; indeed he had one ca of a pigmented papilloma that undoubtedly originat in epithelium.

MELANOSIS COLI.

Prof. M. J. STEWART (Leeds) spoke chiefly melanosis coli—the condition in which there is deposition of melanin or melanin-like pigment in t mucous membrane of the large gut. His ov observations were based on two groups of cases: (*a*) unselected series of 600 autopsies, in which the wh length of the alimentary canal was subjected to care naked-eye examination, but in which only select examples were examined microscopically; (*b*) consecutive series of 100 cases of carcinoma of t colon, in which all cases were examined both mac and microscopically. In the first group 67 cas 11·2 per cent., of melanosis coli were detected mac

opically; in the second group 55, 55 per cent., were und macroscopically and 13 further cases micro- opically. The condition was rare under the age 30, and became increasingly common over 60. he importance played by obstruction in the causation melanosis coli was shown not only by the higher cidence in cases of carcinoma, but also by the fact at the pigmentation tended to be more intense above an below the growth. To the naked eye, the colour the affected mucosa ranged from greyish or buff ippling, through dark grey or brown, to intense ack. Pigmentation was almost always deepest in e cæcum and ascending colon, but in very advanced ses it might extend to the anus. Histologically, e pigment was generally confined to the mucosa, here it lay within the cytoplasm of large mononuclear lls. The epithelial cells, whether superficial or andular, were invariably free from pigment, and e solitary lymphoid follicles were usually so.

The exact nature of the pigment was not clear, but was probably intermediate between a melanin and lipofuscin. It differed from skin melanin in its ower solubility in antiformin, and in being bleached ss rapidly by hydrogen peroxide. Pick's theory the source of the pigment, which now met with neral acceptance, was that aromatic protein sintegration products absorbed from the large testine were converted into melanin within the nnective tissue cells by a tyrosinase-like ferment. is explained the importance of prolonged consti- tion as an ætiological factor, and the tendency for e pigment to be most intense in the cæcum and cending colon where absorption was greatest.

BIOLOGY AND BIOCHEMISTRY OF MELANIN.

Dr. SEYMOUR HADWEN (Toronto) spoke from the int of view of an animal pathologist. He believed at animals were coloured primarily for reasons nnected with their health. In Arctic animals the ange to white in the autumn was a structural ange and not a depigmentation. Trauma, the tes of insects, or bacterial action might result in an tensification of hair colour; on the other hand, they ight injure the cells so much as to prevent their oducing pigment. In horses, contrary to what was n in man, freckles became increasingly common th age. Old horses that lost their hair colour were nerally found to have melanotic tumours, and it med probable that in these cases the skin was ing robbed of the mother substance from which the lanin was made by the tumours themselves. As result the skin was unable to protect the sensitive sues below, and freckling might perhaps be regarded an attempt to bring about protection. In melanotic rses there was an excess of pigment in the epidermis certain parts of the body, resulting in disarrange- nt of the basal layers; there was no evidence, wever, that the surcharged cells descended into e dermis.

Prof. A. T. CAMERON (Winnipeg) discussed the chemistry of melanin production. The old view at hæmatin was a precursor of melanin had had to abandoned, though certain Italian workers still intained that melanin might be a pyrrole derivative. e of the difficulties in studying this subject was to termine whether melanin was a single entity, or ether it was merely a name used to designate stances of different chemical constitution. The tstanding contributions within recent years to the chemistry of melanin had been made by Prof. S. Raper, of Manchester University, and Prof. uno Bloch, of Zürich, the former of whom had idied the mechanism of production of melanin from tyrosine and the latter the action of dopa oxidase. It appeared probable that tyrosine was first oxidised by tyrosinase to dihydroxyphenylalanine—the so-called "dopa." This substance was then converted probably by a reaction involving dehydrogenation, to an indole derivative allied to tryptophane. By decarboxylation and a transfer of hydrogen atoms, dihydroxyindole resulted. Finally by a process of polymerisation melanin was formed. This substance had the alternative formulæ of $(C_8H_5O_3N)_n$ and $(C_8H_7O_3N)_n$, and was entirely free from sulphur or iron. It might be assumed that Bloch's dopa oxidase acted upon the tyrosine derivative dopa by the same mechanism as Raper's tyrosinase to give an identical melanin. Melanin had also been prepared from the urine of patients with secondary melanotic carcinoma of the liver, and from the nature of its preparation it was unusually pure. It was interesting to note that analysis of this urine melanin had given a figure for nitrogen very similar to that found for the melanin prepared by Raper from tyrosine. Examinations by Raper of melanins obtained from the skin of a negro, from the "ink" of the squid, and from a melanotic tumour showed no essential difference in constitution. It might be concluded, therefore, that many melanins were of almost identical structure.

The CHAIRMAN asked Prof. Ewing to define his views on the nature of the cells capable of forming melanin. He likewise drew attention to the extreme malignancy of the melanotic cell.

Prof. EWING, in reply, conceded that melanin might be produced by epithelial cells, but maintained that the nervous origin of melanomata was a view which offered the fewest difficulties in interpretation.

Prof. STEWART, in reply, said that melanomata were perhaps not so malignant as was generally supposed. The average length of life, after operation, of patients he had followed up was 2–4 years. He wished to draw attention to the importance of phagocytes in the transportation of melanin. The presence of melanin in lymphatic glands was not necessarily due to a melanotic metastasis, but might result from the transference of melanin from benign tumours.

Undulant Fever.

Prof. G. S. WILSON (London) read an occasional paper on the diagnosis of undulant fever, with particular reference to Great Britain. He remarked that infection with *Brucella abortus* might give rise to a number of conditions other than typical undulant fever, such as persistent malaise, obstinate headache, joint pains, abortion in women, and focal infections of the internal genital organs in men. In diagnosis the agglutination test was of great value, but its interpretation was often, a matter of considerable difficulty. Generally speaking, a titre of 1/80 or less, in the absence of clinical symptoms, was probably indicative of past infection. A titre of 1/100 or over in the absence of clinical symptoms was suggestive of a latent infection or of repeated past infections. A titre of 1/100 or over, in the presence of pyrexia or other symptoms of disease, was practically diagnostic of brucella infection. A titre of between 1/20 and 1/100, in the presence of typical undulant fever, might likewise be considered as practically diagnostic of infection. The complete absence of agglutinins from a patient's serum did not necessarily exclude the diagnosis of brucella infection. Blood culture was clearly the most satisfactory way of establishing a diagnosis, and every effort should be made to isolate the infecting organism from the blood. Though it was generally possible in *melitensis* infections to

obtain a positive blood culture, in *abortus* infections the percentage of positive results was much lower. Sometimes the infecting organism could be cultivated from other material, such as urine, fæces, or pus. Guinea-pig inoculation was not of great value, except in the examination of contaminated material. Finally, the intradermal reaction, at least in *melitensis* infections, had been reported on favourably by several observers, and its use on an extended scale deserved trial.

Extracts of Staphylococci.

Sir KENNETH GOADBY (London) read a paper on the fractional products of the staphylococcus. Owing to the irregularity of results in vaccine therapy, he had studied the properties of extracts of staphylococci made with water, alcohol, ether, and benzoyl chloride. The aqueous extract contained butyric acid, and substances that gave positive Fehling and Molisch reactions. The alcohol-ether extract contained lipoid-like bodies, which on injection into animals gave rise to an intense local reaction, simulating a carbuncle, though without suppuration. It was probable that the lipoid fraction of the organisms was responsible for the skin reaction in vaccine therapy, and he therefore advocated the use of staphylococci which had been previously treated with alcohol and ether.

Immunological Problems in Septicæmia.

Prof. WILLIAM BOYD took the chair at the second session of the Section, when Prof. FRED T. CADHAM (Winnipeg) opened a discussion on some immunological problems in septicæmia. He intended, he said, to refer to the type of case in which the symptoms of a general bacterial invasion overshadowed those of local origin, and in which chills, sweats, and irregular temperature were associated with the finding in the blood stream of the causative micro-organism—most frequently a streptococcus. In such cases the physician turned for help to the immunologist. The failure of the body to set up an adequate resistance to the invasion of a virulent bacterium might be due to a deficiency in antibody production, or to an imperfect utilisation of the antibodies by the tissue cells. In order to ascertain whether this second possibility was determined by the absence of complementary activity from the blood, he had investigated the amount of complement in health and disease. In the serum of 500 normal persons, complement, as titrated against sensitised sheep cells, was found to exhibit but slight variation. On the other hand, in an investigation of over 1000 patients suffering from different diseases, complement was observed to vary from an increase of 20 per cent. above normal to a complete absence. As a rule the onset of the symptoms of disease was attended by a slight increase in the amount of complement; this was followed by a steady decrease till the infection reached its maximum; while during convalescence a gradual return to normal occurred. The type of fluctuation depended on the disease from which the patient was suffering. In chronic diseases such as tuberculosis, syphilis, arthritis, goitre, diabetes, and uncomplicated malignant disease, only a slight oscillation occurred in the complementary titre of the serum. But in acute infectious diseases, particularly septicæmia, the fall in titre, following the initial rise, was rapid, and in fatal cases might proceed till it reached zero. From these observations he inferred that a high complementary titre in septicæmia was of considerable value in assisting the patient to overcome the infection. He had found that a patient's blood which was deficient in complement might be reactivated, in vitro and in viv by the addition of small amounts of normal serur the increase in complement that occurred lasted, a rule, for 2 to 3 days. In the treatment of septicæm therefore, he advocated the intravenous injecti of the patient every second day with about 30 40 c.cm. of normal serum from a compatible don On alternate days 2 to 5 c.cm. of serum, from a rabl immunised against numerous strains of streptoco and staphylococci, including if possible the particul strain isolated from the patient's blood, should injected subcutaneously. He had applied this meth of treatment to 56 patients suffering from septicæm and had obtained no fewer than 45 recoveries. It mu be admitted, however, that some cases of septicæm particularly those associated with destructive lesio in the brain or heart, were not likely to be benefit by serum therapy.

Prof. WILSON wished to know whether, in t titration of complement, allowance had been made f the natural anti-sheep hæmolysin present in hum serum. In view of the fairly marked variations fou by other workers in the normal complementa titre, he would like to see Prof. Cadham's actu figures, so that it might be possible to work out t standard deviation of the mean of each group, a the standard deviation of the difference between t means of the two groups of normal and diseas persons. Gunn's work did not altogether suppo Prof. Cadham's thesis, since he had found th complement in enteric fever and certain other diseas was generally raised during the pyrexial period, a might be present in large amount even just befo death. It was very difficult to interpret the meani of fluctuations in the complementary titre; a fall titre might be ascribed to diminished production complement, or to a combination of the existi complement with antibodies; unless the antibo titre was determined simultaneously, it was impossi to know which interpretation was correct. Our b results in passive immunisation had been obtain with antitoxic sera; there was less evidence that an bacterial sera were of any great value. Possibly t toxic bodies liberated by certain bacteria were no antigenic; this might account for our failure produce efficient anti-endotoxic sera. In conclusi Prof. Wilson pointed out that the results of any fo of treatment must ultimately be judged by statisti analysis.

Prof. OLIVER S. WAUGH (Winnipeg), speaking fro the clinical standpoint, testified to the value of Pr Cadham's work. Since extensive operations patients with septicæmia often did more harm th good, it was of great importance to do everything facilitate the early diagnosis of suppurative infectio which might lead to septicæmia. It was proba that much might be done by prophylactic vaccinati of patients about to undergo serious operations, su as removal of the rectum or the prostate.

Prof. ROBERT MUIR pointed out how difficult t was to obtain a clear idea of septicæmia. On th one hand there were cases, typified by enteric fev in which there was a simple overflow of organis into the blood from an infective focus; and on th other hand there were cases in which, with only minute lesion such as a pin-prick, the circulation w flooded with bacteria. All intermediate types case occurred. Phagocytosis played an import part in the actual destruction of micro-organis while antibodies were of great value in the establi ment of immunity. We knew nothing of the site complement formation, and the importance of a fa in complement was doubtful; such a fall might

cidental rather than essential. In assessing the lue of a given treatment it was necessary to submit e results to statistical examination; it was also of portance to observe the effect clinically, and he shed that clinicians would approach their cases th an open mind rather than obtain their cue from e bacteriologist.

Prof. CADHAM, in reply, agreed in the difficulty of fining septicæmia. He would not exclude the action complement in the toxin-antitoxin reaction.

Physiology of the Parathyroid Glands.

Prof. J. B. COLLIP (Montreal) gave a general review the physiology of the parathyroid glands. The nction of these glands, he said, was to act as a gulator of calcium metabolism, but the exact echanism by which the calcium in the circulating asma was kept constant was still unknown. The lcium content of normal human blood serum was 11 mg. per cent.; of this, not more than 2 mg. per nt. was in the ionised form, about 4·5 mg. per cent. as in organic, and the remainder in inorganic mbination. Calcium was of importance in the ilding up of the structural elements of bone and oth, in the clotting of blood, in the coagulation of lk, and in the regulation of neuro-muscular tone d irritability. This latter effect was probably due ionised calcium, and since changes in blood pH uld influence the degree of calcium ionisation, there ght be no essential difference between parathyroid tany due to a lowered calcium content of the blood d the tetany of over-ventilation, or of alkalosis, th of which were associated with a normal blood lcium but a diminution in the ionised fraction due an increased pH. The absorption of calcium from e alimentary canal was influenced by several ctors; the soluble chloride, lactate, or gluconate as more assimilable than the phosphate or carbonate. ie excretion of calcium occurred through the lower um and colon, and also through the kidney. There as a very close relationship between the metabolism calcium and of phosphorus, and it was as important determine the ratio between calcium and inorganic osphate in the blood as to estimate the actual ntent of either of these bodies. A rise in inorganic osphate led to a marked fall in the level of blood lcium.

Parathyroid hormone acted as a mobiliser of blood asma calcium; the source of the extra calcium was ne. Injection of this hormone into the dog led a rise in serum calcium, and if sufficient hormone as given marked hypercalcæmia developed, aracterised by anorexia, vomiting, diarrhœa, uscular weakness, respiratory distress, passing of ood by the bowel, bloody vomit, collapse, and death. man, chronic hypercalcæmia, due to increased tivity of the parathyroid glands, was seen in neralised osteitis fibrosa. Calcium metabolism as influenced not only by the parathyroid secretion, it by a number of other factors such as diet, acidosis, kalosis, exophthalmic goitre, and more particularly tamin D. Administered in excessive amounts to gs, vitamin D might produce fatal hypercalcæmia; is body was likewise able to relieve parathyroid tany, and to raise the serum calcium in the para-yroidectomised animal.

Prof. Collip then proceeded to discuss various inical conditions in which calcium metabolism or rathyroid function was disturbed. Chief amongst ese were post-operative tetany, infantile tetany, kalosis tetany, the tetany of spontaneous hypo-rathyroidism, osteomalacia, hunger osteopathy, and on Recklinghausen's disease.

PHYSIOLOGICAL AND CLINICAL FINDINGS.

Prof. V. H. K. MOORHOUSE (Winnipeg) discussed the subject from the physiological standpoint. We knew very little, he said, of the mechanism by which the parathyroid glands were stimulated, and it was not clear whether nerve impulses or chemical substances were responsible. Tetany in animals, following parathyroidectomy, was characteristically a nerve-muscle disturbance; in spite of an increase in the excitability, there was a definite lengthening of chronaxy. In experimental tetany convulsions were due to the effect on the nerve centres of the mid-brain. No relation had been found between changes in the irritability of the peripheral nerves and the severity of the convulsions; this might be ascribed to a general involvement of the nervous system.

Prof. J. C. MEAKINS (Winnipeg) dealt with the diseases in which there was a disordered calcium metabolism. He pointed out that only two of these conditions, namely hypoparathyroidism leading to tetany and hyperparathyroidism leading to von Recklinghausen's disease, were due to disease of the parathyroid glands. Speaking particularly of nephrosis, he remarked that, besides albuminuria and general anasarca, there was a decreased basal oxygen consumption and a lowered calcium content of the plasma. Yet tetany never developed in this disease; this might be due to a lowering of the phosphorus content or the pH of the blood. Cases of nephrosis with a low calcium plasma content often responded well to parathyroid therapy.

Dr. D. R. MCCULLAGH (Cleveland), discussing the treatment of post-operative parathyroid tetany, said that though the calcium content of the serum might be constant, the patient's condition was variable. In such cases he had found an increase in the phosphorus content of the serum. The interesting observation had been made that an increase in blood-sugar was accompanied by a fall in phosphorus. In conjunction with his brother, Dr. E. P. McCullagh, he had, therefore, treated a series of cases by lactose, a dose of about grs. 300 being given by the mouth each day. As a result the serum phosphorus had fallen, and the condition of the patients had improved greatly.

Prof. A. T. CAMERON (Winnipeg) considered the relation between parathyroid secretion and vitamin D as joint controllers of calcium metabolism. In young rats he had found that the normal calcium content of the serum was reached only at the height of summer, but that it was possible to produce a rise in the serum calcium by feeding them with irradiated ergosterol or irradiated food. There was no definite relationship between the quantity of vitamin D administered and the rise in the serum calcium; only a relatively small amount was required to maintain a constant level of calcium. Vitamin D might be the ultimate controller of calcium, acting perhaps through the parathyroid glands.

SOUTH LONDON HOSPITAL FOR WOMEN.—An extension of the out-patients' department which has cost £65,000, raised in three years by private contributions, was opened last week.

WEST SURREY CONTRIBUTORY SCHEME.—The first annual report of the West Surrey and Aldershot Hospital League shows that on Jan. 1st last there were 26,000 members, and that there are now 30,000. During the period reviewed £10,542 was received in small weekly sums, and the Royal Surrey Hospital has benefited to the extent of more than £4000 from this source. There are probabilities of a widening of the area of the League, which was founded in June, 1928.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of two districts which serve in varying degree as dormitories of London :—

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
West Ham C.B. .. (307,600)	18·7	12·7	1·12	1·22	3·2	1·8	74/—	50	2·6
Croydon C.B. (222,300)	15·3	12·5	0·89	1·48	3·2	1·4	65/26	25	3·2

Stillbirths per 100 live births : West Ham 3·4, Croydon 3·4.

West Ham.

Dr. F. Garland Collins says the housing problem, until solved, will continue to act as a check upon almost every other scheme for the promotion of the public health. He cites examples of overcrowding, typical of many others, to illustrate conditions prevailing. No municipal houses were erected during 1929.

The shortage of adequately trained nurses is becoming acute and rendered more so by the increasing number of persons seeking institutional treatment. In Dr. Collins's opinion the conditions of training, prospects, and remuneration of nurses and midwives should be investigated and revised. West Ham is a densely populated (67 persons to the acre) industrial area, as well as one of London's dormitories, with many large factories and a large dock area with resulting casual labour. During 1929 over 42 per cent. of the deaths of West Ham residents occurred in public institutions. Small-pox of the mild type continued through the year. There were 1277 notifications with three deaths, a male infant, a female 2 to 3 years, and a female 25 to 35. The small-pox hospital at Dagenham has been used for consumptives for years. In 1920 these patients had to be sent home when small-pox broke out. A similar tragedy of evacuating over 100 consumptives was averted in 1929, first by the agreement to send a limited number of small-pox cases to Orsett Hospital and subsequently by the timely action of the Metropolitan Asylums Board in admitting small-pox cases from West Ham. Dr. Collins refers to the vast amount of work entailed by this outbreak and thinks our methods of dealing with this mild type of small-pox might be modified with advantage. The fever hospital (210 beds) has the great advantage of a convalescent home at Harold Wood, about nine miles from the borough. At present there is accommodation there for 60 scarlet fever convalescents, who get the benefit of both natural and artificial sunlight. An extension is in progress of four 26-bed wards and four cubicles and should be ready for use next winter.

The Council have no maternity hospital but subsidise Queen Mary's Hospital, Stratford, and the Plaistow Maternity Hospital, in which 989 mothers were confined. There is much antenatal work. There are three clinics in connexion with the extern practice of the Plaistow Hospital, the midwives of which attended 3061 births. The two municipal antenatal clinics were well attended also, and a "follow up" system for the mothers attending was instituted in 1929 under which the health visito paid 3149 visits to 1890 expectant mothers. T births numbered 5766 and midwives, practisi privately or for associations, attended 4140 domicilia confinements and sent for medical help in 7 instances. A large number of women were al confined in the maternity block of the guardian The services of the municipal "home helps" we utilised by 876 mothers. In view of this extensi maternity service work the maternal mortality-ra of the last three years is interesting—viz., 3·0 p 1000 births in 1927, 2·1 in 1928, and 2·6 in 192

The veterinary officer, Mr. H. E. Bywater, repor that 38 per cent. of the cattle slaughtered and 3 per cent. of the pigs were affected with tuberculosi and that four cows giving tuberculous milk and tw with other signs were condemned under the ord as the result of periodical examination of 874 catt He suggests an amended nomenclature for grad milks—viz.: (1) tubercle free milk (i.e., from test herds—whether bottled on or off the farm); (2) clea milk (i.e., that now known as "Grade A"); (pasteurised milk. Mr. Bywater is also of opini from his experience that an appreciable proporti of the contamination of milk by tubercle is due to lac of cleanliness in milking and to the germ-lade atmosphere of the average cowshed.

Croydon.

Dr. Oscar M. Holden says the industrialisatio of Croydon makes rapid headway, and we must hav no repetition of the mistakes of the industrial revol tion. The influenza epidemic pressed most hardl on the old, and although the dry summer caused a increase in diarrhœa deaths of infants, the deat of children of 1 to 5 years were fewer than in 1928– 87 as compared with 96. There was a small outbrea of paratyphoid fever between the middle of Jun and the middle of August—37 cases of modera severity, but with no deaths. The cause of the ou break remained a puzzle, as the disease was n prevalent in contiguous areas at the time.

Housing conditions vary greatly though there is n large area of slums. Unsatisfactory and good are are often adjacent. An inspection of 4000 hous showed 6·6 per cent. overcrowded, using as a standa the minimum permissible for houses-let-in-lodgin under the by-laws. Under present legislation sul letting is the difficulty and a house suitable for o family may contain two or more. Houses which ca be let at not more than 10*s.* per week are the speci need. Over 16,000 gallons of milk is sold daily an 84 per cent. of it is bottled. Bottling is not necessaril a hygienic measure, Dr. Holden remarks, unless th milk put in is clean. The need for the examinatio of contacts of open cases of tuberculosis is not y properly appreciated in Croydon. The occupation scheme at the sanatorium, Cheam, has had a successf year under the guidance of the instructress, Miss M Goodman. Two orders for tapestry have kept a the women who could work busy since Easter. Th scheme has been extended to home work after dischar under the occasional supervision of the instructres who arranges for the sale of the finished article Some of the men continue at home the leather wo learnt in the sanatorium and find their own marke A window at the dispensary is used as an exhibit advertise Cheam products. Such a scheme does n pay expenses but it makes hours, which might l spent in idling or harmful introspection, interestin and profitable, and a hobby is doubly valuable to th tuberculous. There is a decrease in the new cases the V.D. clinic but a satisfactory increase in th number of attendances. The nursery for ailing babi and children up to 5 years has been kept full occupied. It nominally has accommodation f 14 babies and 2 nursing mothers, but the demand wou justify extension. Ten mothers and 77 babies we

mitted during 1929—the babies chiefly for alimen-
y disorders, failure to thrive, re-establishment of
east-feeding, mismanagement, and so on.
In April the Council established a small home for
low-grade mentally deficient boys under 16.
e difficulty in finding institutions for the mentally
ficient has been accentuated by notice from the
tropolitan Asylums Board to remove 30 Croydon
tients. It is hoped to carry out a joint scheme with
County Council for additional accommodation.

EPORTS OF SCHOOL MEDICAL OFFICERS.

—	No. on roll.	Average attend-ance.	Routine inspec-tion.	Special exams. and reinspec-tions.	Percentage of defects.
thampton	12,557	11,219	4,398	10,788	11·8
ckport ..	15,088	13,330	5,198	12,315	26·7
gan ..	13,459	12,020	4,116	8,654	24·8

Northampton.

Dr. Stephen Rowland says the outstanding circum-
nce connected with the service during the year was
continued presence of small-pox in the town since
ly, 1928. There were 112 children of school age
tified, most of the cases being of the prevalent
ld type liable to be mistaken for chicken-pox.
ne of the children had been vaccinated before
posure to infection. Less than 20 per cent. of all
children in the town from 4 to 7 are, in fact,
tected, although the proportion is higher than it
s last year. In 13 departments there was undoubted
ss infection, but it was not found difficult of
ntrol. It was not considered advisable to close
y school, the scheme in operation being found to
rk satisfactorily, though it involved much additional
rk for the assistant medical officers, so that there
re 600 less routine medical inspections this year.
e period between routine dental inspections has
come nearly three years instead of 12 months.
ntal treatment has the excellent record of 2511
es dealt with out of 2667 found to require treat-
nt. Similarly, the results with medical and
gical defects are highly satisfactory, 93 per cent.
ving obtained treatment. The scheme of operation
tonsils and adenoids is working smoothly, and
. Rowland regards this as important, for he is
nvinced that, whatever may be said to the contrary
the lay press against it, nothing short of operation
l be of avail in cases such as those seen at the
ectious diseases hospital.

Stockport.

Dr. N. Gebbie is able to report substantial progress
l a definite prospect of improved facilities. The
w school at Belmont, opened in August, 1929,
rks a step forward in the provision of modern
commodation; in some older buildings the heating
tallation, whose failure necessitated closing for
few days in the winter, has been overhauled.
uctural alterations to be made at the clinic will
ist the dental work, for even with two full-time
ntists and assistance it has been found impossible
carry on with one surgery. Dr. Gebbie pays a
bute to the retiring dentist, Mrs. Sibson, for her
ll and popularity. Parents, he says, have begun
realise more fully the importance of having their
ldren's teeth more properly cared for, and he looks
ward to the time when the system of inspection
l treatment will cover all the children. A large
mber of children (511) are regarded as suitable for
open-air school, and a site with ideal position and
vironment has now been bought. For other
eptional children facilities have been wanting—
re are no day special schools of any kind—but
orts to find places for them in residential schools
ve been unusually successful. In most of the groups
substantial number of cases have been properly
lt with in spite of the difficulties; with the epileptic
re is not only the difficulty of finding accommodation
but the greater obstacle of parents' refusal. Numerous voluntary agencies provide spectacles, surgical apparatus, clogs, convalescence, holidays, Christmas presents, and treats. An object of legitimate pride is the stammering class, the results of which are very promising.

Wigan.

Dr. H. Whitehead reports progress in several directions, and shows the need for more. An approved scheme for orthopædic treatment began at the end of 1927. By arrangement with the county council a special nurse attends every week at the central clinic and an orthopædic surgeon once a month. Cases for hospital treatment are sent to the Biddulph Hospital, Staffs., a fine up-to-date institution under the control of the Lancashire County Council; but the reservation of three beds does not seem large for a town of the size of Wigan. Twenty-six cases of rickets and 50 other deformities were discovered in 1929; many of these, Dr. Whitehead says, would benefit considerably at a special school or by special exercises; but he makes no note of such facilities, and apparently none exist. It is in dental work that most has been done. In September, 1928, a full-time dentist was appointed, assisted by a full-time dental nurse who visits unwilling parents; but there are still 20 per cent. who refuse treatment altogether. It is thought that improvement would follow if head teachers impressed on the children the importance of having the teeth attended to, and insisted on the consent form being returned. There are, it seems, some teachers who take a great interest in the teeth of the school-children and at their schools far more consents are given. In securing treatment for visual defect, too, Dr. Whitehead solicits more help from the teachers. Artificial sunlight treatment has yielded some good results, but attendances are irregular; treatment is given at the infirmary, a long way from many of the homes. The work done at the school clinic is badly handicapped by the inadequate building. By thorough remodelling the school at Warrington-lane has been taken off the black list of the Board of Education. One of the greatest needs of the town, Dr. Whitehead says, is an open-air school, for some 1200 children under 12 years of age are exposed to massive infection by tubercle in their homes. Such schools are badly needed in industrial towns, and no form of expenditure yields a better return for money spent. It is good news that a nursery school is to be started in the present year.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 30TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 99 (last week 93); scarlet fever, 1441; diphtheria, 923; enteric fever, 70; pneumonia, 376; puerperal fever, 29; puerperal pyrexia, 95; cerebro-spinal fever, 11; acute poliomyelitis, 23; acute polio-encephalitis, 5; encephalitis lethargica, 9; dysentery, 7; ophthalmia neonatorum, 99. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 2nd–3rd was as follows:—Small-pox, 209 under treatment, 5 under observation (last week 209 and 4 respectively); scarlet fever, 1548; diphtheria, 1718; enteric fever, 33; measles, 146; whooping-cough, 87; puerperal fever, 23 (plus 11 babies); encephalitis lethargica, 119; "other diseases," 22. At St. Margaret's Hospital there were 14 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (2) from enteric fever, 7 (1) from measles, 6 (1) from scarlet fever, 13 (2) from whooping-cough, 21 (4) from diphtheria, 52 (16) from diarrhœa and enteritis under two years, and 17 (3) from influenza. The figures in parentheses are those for London itself.

The deaths from enteric fever outside London occurred at Willesden and Sunderland. Leeds reported 2 deaths from

whooping-cough; Liverpool and Manchester each 2 from diphtheria. Diarrhœa was responsible for 11 deaths at Liverpool, 3 at Birmingham, and 2 each at Enfield, Wigan, and Salford.

The number of stillbirths notified during the week was 285 (corresponding to a rate of 43 per 1000 births), including 42 in London.

DEATH FROM SMALL-POX.

The death from small-pox reported from Wallasey during the week ended July 26th was that of a patient, aged 34, infected whilst residing in Wallas by a mild unrecognised case which was not unc treatment. Vaccination had been done in infan but only showed a faint mark. The illness develop acutely and was of a hæmorrhagic and toxic ty The patient was removed to the Liverpool P Isolation Hospital on July 19th and died on the 23 Dr. W. Hanna, medical officer of health for Liverpo informs us that there has been no spread of t infection, no doubt as a result of prompt vaccinati or revaccination and supervision of contacts.

CORRESPONDENCE

TREATMENT OF PULMONARY TUBERCULOSIS IN SWITZERLAND.

To the Editor of THE LANCET.

SIR,—As physicians who have been residing and practising in Switzerland for many years, and who are especially interested in the treatment of pulmonary tuberculosis amongst English patients, we wish to protest very strongly against the mischievous letter which appeared in THE LANCET of August 9th (p. 315) over the signature M. G. Davis.

In the first place, Dr. Davis's facts are entirely wrong. The "tourist" industry of Switzerland is not by any means its principal one, but comes fourth or fifth. There is no doubt, however, that the art of making guests comfortable and well looked after is highly developed in this country. This is also the case in Swiss sanatoria, but the puerile remarks, that in sanatoria patients suffering from pulmonary tuberculosis are induced to go to dances and cinemas against their wish, are utterly untrue and too absurd to be discussed.

Switzerland has been well known for very many years for the successful treatment of tuberculosis of the lungs. People come to this country—often after treatment somewhere else without much benefit—not only from England, but from all parts of the world, and England after all supplies but a very small percentage of the patients. Looking at it from a purely business point of view, Switzerland must be able, then, to obtain for them what they come for—i.e., an arrest of their disease. If this were not the case patients would not have come to the Swiss mountains in increasing numbers for the last 70 years, and the Swiss themselves would not have built their cantonal sanatoria for the treatment of pulmonary and surgical tuberculosis on so large a scale in the various high altitude stations at their disposal. Their example has been followed by foreign countries—e.g., Germany, Holland, Belgium, Greece, Hungary—and it is much to be regretted that England gave up the Queen Alexandra Sanatorium in Davos.

Patients come to Switzerland for treatment of pulmonary and other forms of tuberculosis because the country can offer a climate in which it is pleasurable to remain out of doors, even for those unable to take much exercise. The dry, wind-free, and sunny climate of the high altitude stations undoubtedly is a factor which England cannot provide. The Swiss sanatoria are admirably run, and the medical men superintending them are scientifically to the front. The sanatoria possess absolutely modern installations.

We are afraid that Dr. Davis's statements are not based on personal experiences, but are uncontrolled repetitions of small talk.—We are, Sir, yours faithfully,

ED. NEUMANN, M.D.,
Med. Supt., Schatzalp Sanatorium, Davos.
BERNARD HUDSON, M.D., M.R.C.P.,
Sept. 1st, 1930. Davos.

To the Editor of THE LANCET.

SIR,—May I give you the experiences of a pati of mine? I think you will agree that the patient at least an interested party.

"A few years ago," she writes, "I entered a go private sanatorium in England as a patient. I pa £7 7*s.* a week and extras. During the first two mon of my stay there it rained (literally) every day. I shall never forget the misery of the daily walks pouring rain, the return with sodden boots a clothes, the shivering changing in a half-warm room, the damp pouring in at the wide-open windo (envelopes kept in the drawer of a desk always stu themselves down!), and the miserable dashes o meals—the dining-room being a building stand isolated in the grounds—under an umbrella, with consequent necessity of always wearing old cloth a depressing thing to a woman! I wish that y doctor correspondent who talks of the chances England of nature study could have been there. should like to have seen him studying the m And, then, the awful gloom! Bed-patients la often in rooms on the ground floor—watching rain falling on the wet lawn; for the sanatori stood in large grounds, was right in the heart of country, and the road was not visible from windows. The 'closed-in' feeling, *in England,* appalling. All the women cried when they w alone. We admitted that to one another. And th were rumours about the men crying too.

"Certain private business compelled me to cur my 'cure,' and I left the sanatorium. The busin completed I tried once more, and this time went a sanatorium in Switzerland. I paid the equival of £7 7*s.* a week in the summer and extras, and £8 a week in the winter and extras. And, oh! difference. The first thing I noticed was the *ligh* Switzerland as opposed to the awful gloom in Engla the exhilarating feeling of being no longer 'closed for from my window I could see for miles along over the river valley. I revelled in the glory of ever-changing view, the sunrises (if I couldn't sl and the sunsets, and in winter the fascination of ever-changing snow line. I know that the sun the loveliness and the air helped me happily thro a year of bed. And when I got up, no mud, no glo but fields of gentians and primulas, the pleasant of chats with patients from other sanatoria at vill cafés, and playful rivalry as to who was at the sanatorium, and what was happening at each. England the villagers had viewed us with alar And in winter the fun of watching sports and so feeling of participating, to however small an ext in the life of normal folk, instead of the terr feeling of isolation which is, I think, the har thing the tuberculous patient has to bear. sanatorium that I went to in Switzerland tried be a hotel *for the sick;* the one in England—run

most estimable people, I try to believe—was never anything but an institution. In it I know that my spirit was never free."

She adds: "I have been quite well for years and intend to remain so, but I can't help thinking of the other folk." I am, Sir, yours faithfully,

Sept. 3rd, 1930. M.R.C.S.

To the Editor of THE LANCET.

SIR,—Before you close the correspondence following on Dr. Harrison's article, will you allow me to refer to two excellent articles which appeared in your columns a few years ago: (1) Notes on the Value of Swiss Sanatorium Treatment (THE LANCET, 1926, ii., 580), by Dr. Alex Sandison, who had unrivalled opportunities of comparing English and Swiss treatment in the case of Ministry of Pensions patients. After weighing the relative advantages and disadvantages of Switzerland, he came to the conclusion that there are no grounds for the alleged superiority of Switzerland over other places. (2) Can as good Results be obtained by the Treatment of Pulmonary Tuberculosis in the Lowlands as at High Altitudes? (THE LANCET, 1912, i., 1127), by the late Prof. C. Saugman, who showed, as far as statistics can show anything, that the results of treatment close to sea-level are distinctly better than those obtained in the high Alps.

Saugman compared the results obtained over a period of 12 years at his Danish Sanatorium of Vejlefjord, 25 metres above sea-level, with a long series of results obtained at Turban's Sanatorium, Davos, a few years previously at an altitude of 1573 metres above the sea. The results were in favour of the low altitude. For example, taking stage I and stage II cases, those who lost their tubercle bacilli were 72 per cent. in Denmark, against 57·5 per cent. in the high Alps. Again, those admitted with fever who lost their fever by the end of their period of treatment at the sanatorium in the stage II cases were 96 per cent. in Vejlefjord and 80 per cent. in the Alps; in stage III cases 69 per cent. against 44 per cent. Further, those able to work after a period of one to seven years from the time of their leaving the sanatorium in the high Alps, and two to 10¾ years after leaving Vejlefjord, were as follows: In stage I the proportion of patients from Switzerland able to work was 3·3 per cent. higher. But in stage II the percentage was 71 for Danish patients, against 54 for the high Alps; and in stage III, 24·7 for the Danish, against 16·8 for the Alpine ex-patients. These results were in spite of the fact that the average stay in Turban's Sanatorium was 222 days, against 176 days at Vejlefjord.

I am glad Dr. Savy points out in your last issue that the total hours of bright unclouded sunshine at many places in our own isles is little different from the number in the Alps—indeed sometimes higher. For example, the total hours at Lowestoft last year were 1808 hours, and the average there for the 30 years ending 1910 was 1727 hours (see Sir Leonard Hill's "Sunshine and Open Air," p. 46). On comparison with Maurer and Billwiller's "Das Klima der Schweiz," one finds that Lowestoft generally gets rather over half an hour a day more bright unclouded sunshine than Leysin, given as 4·25 hours per diem on the average of the year, and only about seven minutes less than Davos and Arosa.

One further reference. In his address at Portsmouth three months ago before the congress of the Royal Institute of Public Health (see the *Times*, June 6th), Sir Henry Gauvain said that sun treatment for its general effects, especially in surgical tuberculosis, is more effective in his estimation in the constantly changing conditions which are found in the temperate climate of England.

I am, Sir, yours faithfully,

Mundesley, Sept. 7th, 1930. S. VERE PEARSON.

THE MEDICAL TREATMENT OF CANCER.

To the Editor of THE LANCET.

SIR,—In my earlier publications due reference has been made to Prof. Blair Bell's pioneer work. As the time passes I feel the less inclined to be bracketed with him for many reasons, the chief one being that the evidence accumulates to show that the lead ion has only a secondary rôle in the treatment which we use; in fact we have great hopes that this dissentient metal will shortly be eliminated from the treatment altogether. At present we consider the ion lead simply as a vehicle for selenium. Within a week of the publication of my first provisional announcement, Prof. Blair Bell wrote to say that his chemists had had no difficulty in making lead selenide. As I had very carefully gone through his writings and found no reference to selenium, I wrote to him and asked him to contradict publicly an impression of priority which his letter would cause. This he did, and this constitutes the correspondence to which he makes allusion. Now Prof. Blair Bell repeats the programme. From his letter with its hints of correspondence and supervision he would give the impression that the whole method has been taken from him. The system as described has been originated here from the work of others and ourselves, and owes nothing more to him.

I should like to congratulate Dr. P. Gosse and Dr. J. C. Mottram on the result of combination of radiation and selenide, and I hope they will be able to supplement the list considerably in the near future. The details requested were published, at least in some of the cases, as was noted in reference 3 of my paper. In the remaining cases the dosage of radium, radon or deep X rays was the half of what that growth would have been given if radiation had been the only treatment proposed. In all, the radiation was given concurrently with selenide, or the latter was stopped when radiation was started. In view of these bad results and the steadily increasing use of D4S, as shown by the sale figures of British Drug Houses, Ltd., I considered that a warning ought to be issued. I have repeatedly pointed out that this apparent adverse action is to be attributed to the selenium, for radiation after lead guaiacolate does not appear to be deleterious.[1]

I should have thought that my article was in favour of the combination of selenide and radiation therapy; perhaps Drs. Gosse and Mottram will read it again. I am employing the two concurrently in an increasing number of cases, and so far have reason to be pleased with the results. Perhaps a brief account of a recent case may be of interest; it is chosen from several, full accounts of which will probably appear when proof is regarded as adequate.

A girl, aged 25, had her leg amputated through the upper third of the femur for periosteal sarcoma of the tibia. This was followed by recurrence in the femoral stump, and she was referred to me about a year ago. She was treated by the method we have evolved in Bristol, but growth continued slowly, and in June of this year she appeared to be dying; she was much emaciated, had much pain, suffered much from cough and dysphagia. A skiagram showed her lungs and mediastinum to be riddled with large metastases. I then changed her treatment to a selenide not of lead, at present in the experimental stage, and asked for concurrent radiation. A trial dose of deep X rays, one eighth of the carcinoma dose, was followed by slight alteration of the blister leucocyte count; therefore she was given this eighth dose twice weekly, alternately to chest and stump; the selenide was given weekly. I expected that she would not be alive when I returned from holiday early in August, but found her very much better. She had put on weight, lost dysphagia and cough, and another skiagram showed considerable diminution

[1] Brit. Med. Jour., 1929, ii., 325; THE LANCET, 1930, i., 906; and ii., 389.

of the pulmonary masses. I should here record my thanks to Dr. Mayes and the radiological staff of the Bristol Royal Infirmary for their help in this work.

I hope that Drs. Gosse and Mottram will continue their researches, for this aspect of the problem—the combination of selenide and radiation—requires more time than I can give, and a knowledge of radiation to which I cannot lay a claim.

I am, Sir, yours faithfully,

Bristol, Sept. 8th, 1930. A. T. TODD.

PATHOLOGY OF DIABETES.

To the Editor of THE LANCET.

SIR,—Just 25 years ago, in my Goulstonian Lectures (published in your columns [1]), I suggested that diabetes mellitus was a disorder of fat-metabolism, associated with some defect of the pancreas. I gather from Prof. J. J. R. Macleod's Oliver-Sharpey Lectures that all we now know is that diabetes is due to lack of insulin, and that much, at all events, of the sugar comes from fat. May I claim to have made at least an intelligent anticipation of the state of pathological theory a quarter of a century ahead?

I am, Sir, yours faithfully,

WM. CECIL BOSANQUET.

Nottingham-place, W., Sept. 6th, 1930.

LONDON RUBBISH.

To the Editor of THE LANCET.

SIR,—Your leading article is timely. I think it is high time someone drew the attention of the public to the defects in our sanitary services. In the neighbourhood in which I reside the household refuse is left outside the houses for collection in buckets, generally without covers, or without being covered. Owing to their small size they are usually filled to overflowing, this resulting in their contents being blown about the streets. Between 8 and 10.30 A.M. an open lorry appears and the contents of the buckets are chucked anyhow into it with the maximum of noise and clatter. The lorry is gradually filled, also to overflowing, some of the contents of the buckets are distributed about the streets in the process of being emptied, and the streets are further defiled as the lorry jolts along, especially if there is any wind.

We are entitled to be relieved from these insanitary and unsightly methods of refuse removal in view of the enormous expense we are put to for the provision of sanitary services. We should have up-to-date covered wagons, designed to obviate leakage when loading or moving about the streets. These can be seen in quite small continental towns. It should be compulsory for the householder to provide adequate receptacles of standard pattern, and they should be covered when outside the house. The men who carry out the duties should be provided with clean overalls or smocks, and encouraged to keep themselves as clean as may be.

The above-mentioned defects are not peculiar to the neighbourhood in which I live, for one day last autumn at 4.15 P.M. I had part of the contents of one of these dreadfully insanitary open lorries blown into my face—and this in a street overburdened with experts in sanitary science.

I am, Sir, yours faithfully,

LEONARD MOLLOY.

Harley-street, W., Sept. 6th, 1930.

[1] THE LANCET, 1905, i., 903, 977, 1053.

OBITUARY

LEONARD PORTAL MARK, M.D. Brux., M.R.C.S. Eng.

THE death of Dr. Leonard Mark on Sept. 5th, a his house in Oxford-terrace, brings to an end career which combined medicine and art in th service of his fellows. Leonard Portal Mark wa born at Marseilles in 1855, the second son of Edwar Wallhouse Mark, who was at that time British Consu there. He was educated in France which gave hi the lifelong advantage of being bilingual, and entere St. Bartholomew's Hospital from which he qualifie M.R.C.S. in 1879, and L.R.C.P., L.S.A. in 188 He held house appointments at the Sussex Count Hospital, the Richmond Hospital, the General Lying in Hospital at Lambeth, and the Bethlem Roy Hospital, thus obtaining an all-round experience disease. He then settled in Paddington where h gradually built up a considerable general practic but his heart was in his artistic work, and after havir made a hobby of etching he was appointed pathologic artist at St. Bartholomew's Hospital. Although practised hand at depicting the evidences of disea in others, it is a curious fact that he had borne himse for 13 years the facies of acromegaly before becomin aware of it. "Each day," he wrote in his aut biographical study, "when I looked into the gla to brush my hair, there was a typical acromegal literally staring me in the face. Yet I nev recognised the fact." It was in 1892, he tells u in the ABC shop in Little Britain to which Bart. men then resorted, that he told Sir Archibald Garr of his increasing effort to make his jaws meet. Garro who already knew of Mark's eye symptoms, made th diagnosis, but kept it to himself. In Novembe 1905, Mark was crossing Cavendish-square wh the self-revelation came, and on returning home four his own condition described in Bowlby's "Pathology Although the disease took its usual course wi severe headache and increasing disability, th philosopher in Mark transcended the patient, and h not only published his personal experience of th disease, but contributed to our own columns a stud of Richard Dickinson of Scarborough, shoe-clean and gingerbread vendor, whose portraits by sev contemporary artists betray the stigmata acromegaly. The 1726 portrait of Dickinson probably the first representation of acromegaly to b found in this country, although earlier ones we recognised on the continent. Some acromegal features Mark found too in the physiognomy a temper of the Punchinello of our street show. Ma bore his sufferings with great courage, and it gratifi his friends to know that his headaches became le severe as he became more infirm. He was caref to preserve a series of photographs to serve as a reco of the progress of his disease. Apart from his writin on acromegaly he collaborated in the translation Pozzi's "Gynæcology" in three volumes issued b the New Sydenham Society. He was at one tim President of the West London Medico-Chirurgic Society, and Vice-President of the Harveian Societ

"THE ROYAL PLYMOUTH HOSPITAL."—Th governors and subscribers of the Central Hospit Plymouth, have agreed, in principle, to the amalgamati of that institution with the South Devon and East Cornw and Royal Albert Hospitals under the style of "The Roy Plymouth Hospital." The object is coöperation a coördination.

MEDICAL NEWS

National Council for Mental Hygiene.

A series of lecture-discussions has been arranged by this Council, and will be held at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., at 5.15 P.M. on certain Thursdays in October and November. Dr. G. W. B. James will start the course with a lecture entitled a Physician Looks at History (Oct. 16th); Dr. Alice Hutchison will speak on Preventive Treatment in Childhood (Oct. 23rd); Dr. Edward Mapother on Alcoholism and Drug Addiction (Oct. 30th); Prof. William Brown on Mental Conflict and the Development of Character (Nov. 13th); Dr. Doris Odlum on the Psychology of Adolescence (Nov. 20th); and Dr. R. G. Gordon on the Importance of Mental Deficiency (Nov. 27th). Tickets are obtainable from the Secretary of the Council, 78, Chandos House, Palmer-street, S.W. 1, or at the doors.

The second Mental Health Conference organised by the Council will be held in May, 1931.

A Faculty of Medicine for Marseilles.

The premier seaport town of Marseilles, which is already the seat of a medical school, is to become endowed with a regularly constituted medical faculty. This result has only been attained by slow degrees, for the establishment of the faculty was for long held in suspense. The site and various parts of this new institution is to be the Pharo Palace, which was constructed on behalf of the late Empress Eugénie. The chateau is attractively situated, overlooking the sea.

Lectures on Medical Hydrology.

The Committee for the Study of Medical Hydrology is arranging its programme for the coming winter. The object of the Committee is to supply lecturers, on the subjects of spa treatment and general medical hydrology, for medical societies and for medical schools where these subjects are not already included in the curriculum. A list of the lecturers available will be forwarded on application to Dr. Geoffrey Holmes, 11, Ripon-road, Harrogate.

International Society of Medical Hydrology.

The annual meeting of this society is being held this year in Lisbon and the Portuguese spas, from Oct. 15th-23rd, in conjunction with the Congrès international d'Hydrologie. One medical discussion is being arranged by the Society, on the Treatment of Digestive Disorders by Waters and Baths. General meetings will also be held to consider a system for the international registration and classification of waters, the organisation of health resorts for insured workers (social hydrology), and proposals for the protection of the names of the spas. The Portuguese spas to be visited include Coimbra, Curia, Oporto, Bussaco, and Vidago. The meeting is open to non-members and a limited number of medical practitioners and students interested in hydrology are invited to take part. Applications should be received at the office of the Society, 55, Wellington-road, London, N.W. 8, not later than Sept. 15th. The journey to Portugal may be made by sea from Boulogne, or overland.

Donations and Bequests.

Mr. W. J. R. Pochin, of Wigston, Leicestershire, left £1200 to the Leicester, Leicestershire, and Rutland Institution for the Blind.—Miss E. E. Oates, of South Royde, Halifax, Yorks, left £1000 to the Royal Halifax Infirmary.—Mrs. I. N. Whipp, of St. Annes-on-the-Sea, who left £12,269, left £500 in trust for the relief of the poor of Clitheroe, £300 to the Cripples' Home, Strangeways, Manchester, £200 to St. Mary's Hospital, Manchester, and one-third of the residue of the property to the Blackburn Infirmary.—Elizabeth Lady Smiley, of Park-street, London, W., Forest House, Bournemouth, and Larne, Co. Antrim, among other bequests left £3000 to the Smiley Cottage Hospital, Larne, Co. Antrim, £5000 to the Royal Victoria Hospital, Belfast, £6400 to the Royal Alexandra Infirmary, Paisley, and £5000 to the Hugh Smiley Day Nursery, Paisley.—Mr. Joseph Watson, of Bramhall, left £1000 each to the Salford Royal Hospital, the Manchester Royal Infirmary and Dispensary, and the Ancoats Hospital and Dispensary; also £500 each to the Coal Smoke Abatement Society, Manchester, and the Northern Counties Hospital for Incurables, Mauldeth.—Fleet Surgeon A. T. Corrie, R.N. (retd.), Plymouth, left £32,473. He gave £1000 each to the Cripple Home for Boys at Kensington, the Royal United Service Orphan Home for Girls, Devonport, and the Orphan Home for Girls at Lockyer-street, Plymouth; and £500 to the Corporation Grammar School, Plymouth. After a personal bequest of £1000 he left the residue of the property to St. Bartholomew's Hospital.

Lectures in Tropical Hygiene and Nursing.

The County of London Branch of the British Red Cross Society (27, Grosvenor-place, S.W.1.), has arranged a course of nine lectures and demonstrations on Tropical Hygiene and Nursing, to be given at 8 P.M., on Wednesdays, from Oct. 1st, at 27, Grosvenor-place.

Middlesex Hospital Medical School.

Mr. Eric Pearce Gould will give the introductory address when the ninety-sixth winter session of this school opens at the Queen's Hall, Langham-place, on Wednesday, Oct. 1st. Mr. Arthur Greenwood, the Minister of Health, will take the chair at 3 P.M., and distribute prizes gained during the past year. After the ceremony the wards of the new west wing, the new nurses' home, the medical school, and the research department will be open for inspection.

Queen's Hospital for Children.

Last year new out-patients (30,806) showed a reduction of about 4000 which the annual report attributes to the continued improvement in public health organisation. Each out-patient cost 6*s*. 3*d*. There were 1969 in-patients who cost £12 13*s*. 7*d*. each. The income was £34,998, and the expenditure £33,135. A debt of nearly £10,000 has been reduced to £3225, and the hospital has paid its way since 1924, but money for extensions is now needed.

Royal Sanitary Institute.

Dr. G. F. Buchan will preside over a sessional meeting of this Institute, to be held at Hereford on Saturday, Oct. 4th. The Mayor (Mrs. Luard) will open a discussion on the Place of Women in Local Government, Mr. G. H. Jack, F.R.I.B.A., on the Preservation of the Countryside, and Mr. J. R. Barker, M.R.C.V.S., on the Health Authority and the Milk Supply.—At a sessional meeting at Nottingham on Friday, Oct. 10th, Mr. A. R. Atkey will speak on River Pollution, and Dr. L. P. Lockhart will open a discussion on Industrial Medicine in Relation to Public Health. Dr. Charles Porter will take the chair.

Paddington Medical Society.

At a meeting of this society held at the Great Western Hotel on Sept. 9th, Dr. E. G. Graham Little, M.P., spoke of the imminence of a scheme for a State medical service, and of the drawback to extension of contract medical practice on existing lines. Mr. E. B. Turner said that while medical benefit under the Insurance Act was working well in rural districts, the situation was different in urban districts where there were rumblings of a coming storm. In the discussion which followed attention was called to the increase of voluntary contract practice in the work of the London Public Medical Service, and to the need for those actually engaged in practice to make their views effectively known.

Royal Institute of Public Health.

The Harben lectures for 1930 will be given at this Institute by Prof. William H. Park, of New York, at 4 P.M. on Oct. 6th, 7th, and 8th. His general subject will be Pneumonia, and the three lectures have the following titles: (1) the Types of Pneumococci in Adults and Children and Their Significance; (2) the Epidemiology; the Refining of Anti-pneumococcus Serum; (3) the Therapeutic Use of Vaccines and Antibacterial Sera.—The address of the Institute is 37, Russell-square, London, W.C. 1, and no ticket of admission is required.

A course of lectures on the Prevention of Accidents, Disorders, and Diseases, is to be given at the Institute at 4 P.M. on Wednesdays from Oct. 15th. The speakers will be Dr. E. Graham Little, M.P., on the Prevention of Accidents, Disorders, and Disease in Members of the Medical and Nursing Professions (Oct. 15th); Prof. W. S. Lazarus-Barlow, M.D., on the Prevention of Pre-cancerous States and the Arrest of Cancer (Oct. 22nd); Lieut.-Colonel J. A. A. Pickard on the Prevention of Street Accidents (Oct. 28th); Prof. S. Lyle Cummins, M.D., on the Prevention of Tuberculosis (Nov. 5th); Dr. R. Stenhouse Williams on the Importance of a Complete Study of the Nutritional Value of Milk (Nov. 12th); Dr. Arthur Massey on the Prevention of Venereal Disease (Nov. 19th); Mr. Leonard Ward on the Prevention of Accidents in Factories and Workshops (Nov. 26th), Prof. D. B. Blacklock, M.D., on the Prevention of Disorders and Diseases in Tropical Countries (Dec. 3rd); Sir Hubert Bond, M.D., on the Prevention of Mental Illness (Dec. 10th); and Prof. E. L. Collis, M.D., on the Prevention of Industrial Diseases (Dec. 17th).

Royal Waterloo Hospital.

Last year out-patients' attendances increased from 56,000 to nearly 70,000, and the department will have to be further extended, but the cost of land in the vicinity of the hospital makes the problem difficult. The surplus of income over expenditure was used to reduce the accumulated deficits, which now stand at £2797.

West Kent Hospital.

The ninety-seventh annual report of the West Kent General Hospital, Maidstone, shows that last year there were 1251 in-patients who cost 10*s.* 5*d.* per day and stayed an average of 23·3 days. Including casualties there were 9899 new out-patients. The cost per occupied bed was £190 1*s.* 9*d.* There are 102 beds, 8 of them for paying patients. The Pay Day Fund provided the hospital with £3746. Extensions costing over £50,000 are in progress; they include three new wards and additional accommodation for the nursing staff. The new wards are being given (£30,000) by Mr. and Mrs. G. Foster Clark.

Arsenic in Sweets.

About 30 children have been taken ill in Staffordshire and Cheshire after eating sweets made at a small factory at Burslem, Stoke-on-Trent. It is stated that the arsenic was contained in a dusting powder used to prevent the sweets from adhering to each other. As much as two-thirds of a grain has been found in a single sweet, but as yet there have been no fatal cases of poisoning. Efforts are being made to trace all the supplies distributed to retailers, and 50 bottles have been confiscated. It is believed that several hundredweight of the sweets have been sent out to shopkeepers in an area stretching from Crewe to Leek, including Congleton, Burslem, and Newcastle (Staffs.) The factory has been closed, and parents have been warned to send for medical aid if a child shows signs of illness after eating boiled sweets.

Vacancies

For further information refer to the advertisement columns.

Ascot, Heatherwood Hospital.—Res. Asst. M.O. £300.
Barnsley Beckett Hospital and Dispensary.—Jun. H.S. £140.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Bath, Royal United Hospital.—Asst. H.S. At rate of £120.
Bedford County Hospital.—H.S. £175. Also Asst. H.S. £130.
Birmingham, Ear and Throat Hospital, Edmund-street.—Res. Anæsthetist. At rate of £150.
Birmingham, Selly Oak Hospital.—Cas. O. £200.
Blackburn Royal Infirmary.—4th H.S. £150.
Bradford City.—H.P. for Grassington Sanatorium. £225. Locum Assistant Pathologist. £12 12*s.* weekly. Vacancies on Staff of City Pathologist and Bacteriologist. £600.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £100.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Bury Infirmary, Lancashire.—Third H.S. At rate of £150.
Cambridge, Addenbrooke's Hospital.—H.S. Also H.S. to Special Depts. Each at rate of £130.
Cardiff City Council, P.H. Dept.—Half-time Pupil Asst. M.O. £250.
Cardiff, King Edward VII. Welsh National Memorial Association. Area Asst. Tuberculosis Phys. £600. Also half-time Asst. Tuberculosis Officer for Pontypridd area. £300.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100–£175.
Colchester, Essex County Hospital.—Asst. H.S. and Reg. £120.
Colchester, Royal Eastern Counties Institution for the Mentally Defective.—Research Worker. £750.
Connaught Hospital, Orford-road, E.—H.P. At rate of £100.
Dartford, Kent, City of London Mental Hospital.—Jun. M.O. £400.
Derby, Derbyshire Hospital for Sick Children.—Res. M.O. At rate of £150.
Dorchester, Dorset Mental Hospital.—Jun. Asst. M.O. £350.
Dublin, Richmond, Whitworth and Hardwicke Hospitals.—Hon. Phys.
East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. At rate of £200. H.P. At rate of £150. H.S. At rate of £120.
Essex, Administrative County of.—Asst. County M.O.H. £500–£700.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Second H.S. At rate of £120.
Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. £150 and £140 respectively.
Grimsby and District Hospital.—Res. M.O. £200.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Hertford County Hospital.—Res. Surg. O. At rate of £250.
Hôpital Français, 172, Shaftesbury-avenue, W.C.—Jun. Res. M.O. £100.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., and H.P. Each at rate of £100.
Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.
Ilford, King George Hospital.—Asst. Res. M.O. £250. Also House Officer. £100.
Infants Hospital, Vincent-square, Westminster.—Two H.P.'s. Each at rate of £75.
Inverness District Mental Hospital.—Jun. Asst. M.O. £350.
Inverness Northern Infirmary.—3rd. Res. M.O. At rate of £100
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150 Also H.S. At rate of £120.
Islington Dispensary, 303, Upper-street, N.—Asst. Res. M.O. £250
Kingston-upon-Hull, City and County of, Beverley-road Institution.—Asst. M.O. £300.
Lanark, County of.—Bacteriologist and Pathologist. £750.
Lancashire County Council.—Asst. County M.O. £800.
Lancaster County Mental Hospital.—Asst. M.O. £350.
Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of £52.
Liverpool Open-Air Hospital for Children, Leasowe.—Jun. Res. M.O. £200.
London Lock Hospital, 91, Dean-street, W.—Two H.S.'s. Each at rate of £200.
Macclesfield General Infirmary.—Res. H.S. At rate of £180.
Manchester, Ancoats Hospital.—H.S. At rate of £100.
Manchester City Education Committee.—Asst. School M.O. £600
Manchester Royal Infirmary.—Jun. Asst. M.O. for Radiologic Dept. £400.
Manchester Victoria Memorial Jewish Hospital, Cheetham.—Sen. H.S. £250.
Merthyr General Hospital.—Res. H.S. At rate of £150.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. At rat of £150. Also H.P., and H.S. Each at rate of £125.
Narborough, near Leicester, Leicestershire and Rutland Mental Hospital.—Locum Tenens. M.O. 7 gns. a week.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
Newcastle-on-Tyne, Royal Victoria Infirmary.—Hon. Surgeo to Throat and Ear Dept.
Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. H.S At rate of £100. Also Res. H.P. and Res. Sen. H.S. Eac at rate of £95.
New Zealand, Christchurch Hospital Board.—Med. Reg. £50
Northampton General Hospital.—H.P., Two H.S.'s, and Tw Asst. H.S.'s. Each at rate of £150.
Northwood, Middlesex, Mount Vernon Hospital.—H.S. £200.
Nottingham Children's Hospital.—Res. H.S. At rate of £150.
Nottingham General Hospital.—Cas. O. Also H.P. Each at rat of £150.
Oldham Royal Infirmary.—Two H.S.'s. Each at rate of £17
Plymouth, City Hospital.—Res. M.O. £350.
Pontypridd Women's Welfare Centre.—Woman Doctor for Birt Control Clinic. 1½ gns. per session.
Poole, Dorset, Cornelia and East Dorset Hospital.—H.S. A rate of £150.
Portsmouth Royal Hospital.—Sen. H.S. At rate of £175. Als H.P., Two H.S.'s, and Cas. O. At rate of £130 and £10 respectively.
Preston and County of Lancaster Royal Infirmary.—H.S. A rate of £150.
Princess Louise Kensington Hospital for Children, St. Quintin avenue, N. Kensington, W.—H.S. and Cas. O. At rat of £75. Also Hon. Physician and Hon. Radiologist.
Reading, Royal Berkshire Hospital.—Cas. O., and Res. Anæsthetist. At rate of £150.
Royal Free Hospital, Gray's Inn-road, W.C.—Asst. Physicia
Royal Waterloo Hospital for Children and Women, Waterlo road, S.E.—Hon. Clin. Asst.
St. Bartholomew's Hospital, E.C.—Asst. Surgeon for Diseases Throat and Nose. Asst. Surgeon to Orthopædic Dept. Als Asst. Dental Surgeon.
St. Helen's Hospital.—H.S. £250.
Salford Royal Hospital.—H.S. to Orthopædic Dept. Also H. Each at rate of £125.
Salop County Council.—Asst. M.O. £600.
Sheffield Royal Hospital.—Res. H.S. Res. Anæsthetist. Tw H.S.'s. Also Ophth. H.S. All at rate of £80.
Shrewsbury, Eye, Ear, and Throat Hospital for Shropshire.—H. £200.
Southampton, Royal South Hants and Southampton Hospital.—Asst. H.S. At rate of £180.
South Shields, Ingham Infirmary.—Jun. H.S. £150.
Stafford, Staffordshire General Infirmary.—H.S., and H.P. A rate of £200 and £150 respectively.
Stockport Infirmary.—Res. Surg. O. £250. Also H.P. £175.
Swansea Hospital.—H.S. £150.
Talgarth, Breconshire, Mid-Wales Counties Mental Hospital.—Asst. M.O. £350.
Taunton and Somerset Hospital.—Sen. H.S. At rate of £150.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H. At rate of £100.
Walsall General Hospital.—H.S. At rate of £150.
Walsall, Manor Hospital.—Res. Asst. M.O. £200.
Warrington, Whitecross Hospital.—Asst. Res. M.O. £225.
West Lothian, Bangour Mental Hospital. — Second Ass M.O. £350.
Wigan County Borough Education Committee.—Asst. Scho M.O. £500.
Wolverhampton and Midland Counties Eye Infirmary.—H. £150.
Woolwich and District War Memorial Hospital, Shooters Hil S.E.—H.S. At rate of £100.
Worcester, Besford Court Catholic Mental Welfare Hospital f Children.—Res. Med. Reg. At rate of £150.

The Chief Inspector of Factories announces vacant appointmen for Certifying Factory Surgeons at Littlehampton (Sussex Flint (Flintshire), and Glenluce (Wigtownshire).

The Home Secretary gives notice that in consequence of th resignation of Dr. David Duke Monro, Medical Refere under the Workmen's Compensation Act, for Wigtow County (Sheriffdom of Dumfries and Galloway), the appoin ment held by him is vacant. Applications for the po should be addressed to the Private Secretary, Scottish Offic Whitehall, London, S.W.1, and should reach him not late than Sept. 27th.

NOTES, COMMENTS, AND ABSTRACTS

AN EXPERIMENTAL WORKSHOP COLONY FOR TUBERCULOSIS AT BRESLAU.

THE colony established by the Society for the Control of Tuberculosis at Breslau in the grounds of the Municipal Tuberculosis Hospital of Breslau-Herrnprotsch has now been running for a year. It was opened on July 1st, 1929. Out of 32 houses intended for the use of one family, 30 had been let by May 1st, 1930, and in the two homes for unmarried persons, 27 of the 35 beds had been taken by women; 8 single men are living as sub-tenants in the family houses, and applications have been made for the remaining accommodation, so that the colony is almost full.

THE PROBLEM.

The workshop colony is an attempt to solve the housing problem for persons who are unsound, or incapable of complete recovery, by offering them treatment for an indefinite period under conditions which are favourable to work, and which at the same time leave the invalid in the care of his family. The arguments urged against dwelling-colonies for tuberculous patients do not affect workshop colonies, which should be regarded as a necessary complement of the tuberculosis hospital; the introduction of work therapy should be contemplated from the beginning in planning future hospitals. The conception of a combination of a hospital and a workshop colony was first put into practice at Papworth, where institutional treatment is given to those persons who need it for a limited period, while treatment of long duration is carried out by the domestic and medical provisions of the work-shop colony.

The Breslau Society for the Control of Tuberculosis undertook the scheme in 1927 at the instigation of Dr. Ernest Brieger, who had studied the Papworth plan closely, and is now more firmly convinced than ever that a work-shop colony can only be developed with success in connexion with an institution, and under the direction of the physician in charge.

The plan followed by which houses of four to five rooms intended for the use of one family only were built, has the advantage that the affected person can live in the upper story almost completely isolated from the family. For families without children the houses are somewhat expensive, and in future a certain number of smaller and simpler houses will be built. Arrangements have been made to allow the heating for the small houses to be introduced from the two homes for unmarried persons. In each house a small kitchen is supplied which is not intended or constructed as a living room, and food is cooked by gas, an average gas bill reaching from 8 to 15 marks per head. The invalid's room is let suitably furnished, and under the hire-contract no further furniture may be installed. The same principle holds in the homes for unmarried persons, each of whom occupies a room to herself, with running water laid on.

FINANCE.

The cost of the whole project, including inside fittings, was between one and two million marks, of which 160,000 were lent by the Imperial Insurance Institution at 6 per cent., 150,000 by the General Local Sick Fund of Breslau, at 7 per cent., and 300,000 by the National Insurance Institution of Silesia, at 6 per cent.; 25,000 marks were placed at the disposal of the Society by the Imperial Ministry of Labour, and 2000 marks each by the German Central Committee and the Ministry of Welfare, respectively. The interest on this capital could clearly not be raised from the tenants themselves. The rent has been fixed at 115 marks per month, a figure which it will be possible to maintain as long as an annual subsidy of 7000 marks is received from the tax on house-rent. Rent of a furnished room is 100 marks, but such sums cannot be borne by the tenants alone; the National Insurance Institution has granted 2·50 marks per day for married or single patients. The remaining 40 marks per month are raised by the tenant and, in the case of married recipients of benefit, the town of Breslau plays a part; in the case of unmarried persons the Welfare Bureau makes a contribution. Most of the patients have passed through the hospital either for examination and observation or for prolonged periods of treatment; they are selected by a committee, and persons belonging to other localities have been excluded from the first. Progressive and hopeless cases were also rejected, and preference given to patients in whom a clinical cure might be expected following protracted treatment under favourable conditions.

THE WORK.

The work offered has been suited to the capabilities and tastes of the workers; tailoring, locksmith's work and joinery are some of the trades in which patients are employed. The directress of the sewing-room was a patient for three years and has designed a new form of invalid attire; the whole of the necessary linen of the Herrnprotsch Institution is now being produced in the workrooms, which are equipped with electric sewing and knitting machines. Patients work two to four hours daily, and their wages amount from 20 to 50 marks a month. Joinery is carried on as a self-supporting trade, and coffins are produced for the municipal infirmaries at the rate of about 40 a month. In the locksmiths' workshop, steel house fittings are manufactured, and will bring in a living wage as long as sufficient work can be found. The bookbinding section is beginning to make headway, although it is still unremunerative.

The effects of the scheme, almost throughout, have been an improvement in the weight, depression and clinical and X ray findings of the patients, who are with difficulty restrained from doing more than the prescribed amount of work. The difficulty of maintaining the supply of employment is still a serious one, and a work period of more than four hours at a time cannot be guaranteed. Although it is too early to judge of the ultimate success of the colony, the initial success cannot be denied. It is creditable to have ensured a suitable way of life for 80 cases of recognised tuberculosis, but it is even more satisfactory to have provided a healthy environment for 60 children coming of tuberculous parentage. Careful supervision is exercised, and the children are all radiographed and examined at intervals; a school and kindergarten are in the process of erection.

THE FUTURE.

Without energetic help from all classes of the community, constructive work is impossible in these days of economic need. Without assistance the work from the National Insurance Institution shops could not have been developed, and even yet they are housed in unsuitable quarters. There is reason to hope, however, that the German Central Committee will offer such support as will make the construction of modern work-shops possible. Dr. Brieger, who is in charge of the hospital and colony, is cautious in his estimate of the value of the scheme.[1] It is easy, he says, to start. The difficulties will only become fully apparent when the new principle has been carried out in its entirety.

[1] Tuberkulose-Fürsorge-Blatt, 1930, No. 5.

FOOT-AND-MOUTH DISEASE.—The Ministry of Agriculture announces that foot-and-mouth disease has appeared at Holbeck, Leeds. This is the first outbreak in Great Britain this year.

PATHOLOGICAL AND BACTERIOLOGICAL LABORATORY ASSISTANTS' ASSOCIATION.

TRIENNIAL CONFERENCE.

THE third triennial conference was held in the medical school of the University of Manchester from August 25th to 29th. The conference was opened on August 25th by Dr. W. H. Lang, D.Sc., F.R.S., Prof-Vice-Chancellor and Barker Professor of Cryptogamic Botany in the University. He emphasised the value of the skilled assistance and coöperation of laboratory assistants in any research work and congratulated the association on its efforts to raise the status and improve the training of technical assistants. The vice-president, Mr. C. W. Ashton, then welcomedthe members to Manchester. The mornings of the conference were devoted to various lectures and papers delivered in the lecture theatre of the Medical School, and an exhibition of laboratory work and apparatus was displayed. On Wednesday, August 27th, the conference visited Liverpool where Prof. W. Blair Bell gave a lecture on Laboratory Research in Cancer.

The conference dinner was held on August 28th. The principal guests were the Pro-Vice-Chancellor, Prof. A. E. Boycott, F.R.S., Dr. D. Stewart, Dr. W. Susman, and Dr. A. F. C. Davey. During the evening the Sims Woodhead Memorial Medals were presented to Prof. Boycott and Mr. W. A. Mitchell (Cambridge) for conspicuous service to the Association. Mr. A. Norman and Mr. J. McLean spoke of work done for the Association by the recipients, especially in the earlier days of the Association, when it was fundamental to the success of the movement that the sympathy of the laboratory chiefs should be obtained.

Prof. Boycott said that his position as Secretary of the Pathological Society of Great Britain and Ireland at the time the Association was formed had allowed him to dispel the fears of that Society that it was designed to usurp the Society's activities. The attendance at the conference showed how widespread is the organisation of the Association, members attending from Uganda, North and West Ireland, as well as from all parts of England and Scotland.

PSYCHOLOGY OF THE SMALL CHILD.

MOST of the problems in the life of children in the early school years are helpfully discussed in a small book [1] recently published which deserves attention. The volume is ambitious in scope. For example, the imaginal, intellectual, and creative life of children at the fifth year are subjected to long consideration, and even such difficult problems as the child's spiritual needs are discussed. Despite the scientific difficulties of this last topic, the authors have achieved some measure of success in this section. Various activities of the older child are then dealt with—physical, social, constructing, literary—and on each subject sound sense is offered in attractive language. The chapter on types of children is not quite so happy. Understanding of the maladjusted child cannot be obtained satisfactorily in the absence of an understanding of the unconscious operations of the mind. The authors should make a separate volume of this chapter.

[1] The Child from Five to Ten. By Evelyn and Miriam Kenwrick. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1930. Pp. 299. 7*s*. 6*d*.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL.—The annual report once more brings out the difference in the death-rate between "booked" and "emergency" cases. There were last year 2360 in-patients—1916 married women and 444 single women with their first child. The death-rate for "booked" cases was 3·2, and for "emergency" cases 43 per 1000; the infantile death-rate in the former category was only 25 per 1000 as compared with 153 in the latter. The number of women attended in their own homes was 1546, and for the third year in succession there were no maternal deaths. The first patients were received into the new isolation block at Hammersmith last week.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 15th, to SATURDAY, Sept. 20th.—WESTMINSTER HOSPITAL, S.W. Post-graduate Course in Medicine, Surgery, and the Special Departments occupying each day from 10.30 A.M. to 5.30 P.M., with lectures and demonstrations. Men only. Fee £5 5*s*. Copies of syllabuses for forthcoming courses may be obtained from the Fellowship of Medicine, 1 Wimpole-street, W.1.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Sept. 15th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M. Medical, Surgical, Throat, and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Children's Diseases Clinics. Operations.

Appointments

ADAMS, J. R., M.B. Edin., D.P.H., has been appointed County Medical Officer for Roxburgh.

BACH, FRANCIS, D.M. Oxf., Medical Registrar to the British Red Cross Society's Clinic for Rheumatism, Peto-place, London.

BROWNLIE, J. L., M.D. Glasg., D.P.H., a Medical Officer of the Department of Health for Scotland.

GREGORY, J. C., M.R.C.S., L.R.C.P., House Physician to Medical Unit, University College Hospital, London.

JACK, James, *M.C.*, M.B. Glasg., Medical Officer of Health for the city of Durham.

SHARP, C. J. H., to be Certifying Surgeon under the Factory and Workshop Acts for the Linslade District of the County of Buckingham.

STEPHENSON, H. M., to be Certifying Surgeon under the Factory and Workshop Acts for the Maiden Newton District of the County of Dorset.

TOPPING, ANDREW, M.D. Aberd., D.P.H., Medical Officer of Health for Rochdale.

Births, Marriages, and Deaths

BIRTHS.

CHAMBERS.—On Sept. 6th, in London, the wife of Guy Chambers, F.R.C.S. Eng., of Ryde, and Bolton-gardens, S.W., of a son.

COLE.—On Sept. 5th, at Trumpington-street, Cambridge, the wife of Leslie Barrett Cole, M.D. Camb., M.R.C.P. Lond., of a son.

DANBY.—On Sept. 7th, 1930, to Victoria (née Arkell), wife of Alfred Danby, F.R.C.S.E., at the Homestead, Woodbourne road, Birmingham—a daughter.

GLADSTONE.—On Sept. 5th, at The Old House, Rendcomb, Cirencester, the wife of F. C. Gladstone, D.M. Oxf., of a son.

KEYS.—On Sept. 1st, at Ravello, Ruislip, the wife of Sidney Hudson Keys, M.R.C.S. Eng., L.R.C.P. Lond., of a son.

MILLER.—On Sept. 1st, at Grosvenor-road, Tunbridge Wells, the wife of T. Mackinlay Miller, M.R.C.S., L.R.C.P. Lond., of a son.

MONCRIEFF.—On Sept. 2nd, Honor (née Wedmore), wife of Alan Moncrieff, M.D., M.R.C.P., of a son.

MARRIAGES.

BASSETT—BURRELL.—On Sept. 3rd, at St. Paul's Church, Edinburgh, John Mories Bassett, M.D., F.R.C.S. Edin., only son of W. Bassett, Christchurch, New Zealand, to Kathleen Alicia, eldest daughter of the late H. M. Burrell, Edinburgh.

PEEL—MONYPENY.—On Sept. 2nd, at Fisherwick, Presbyterian Church, Belfast, Albert A. Fitzgerald Peel, M.A., D.M. Oxf., son of Dr. A. A. Peel of Glasgow, and Crumlin, Co. Antrim, to Mary Watson Monypeny, M.Sc., daughter of the late Dr. William Monypeny of Belfast.

DEATHS.

MARK.—On Sept. 5th, at Oxford-terrace, W., after a long illness, Leonard Portal Mark, M.D., son of the late Edward W. Mark, late Consul of Marseilles.

MUSGRAVE.—On Sept. 2nd, Cecil B. T. Musgrave, M.D. Lond., M.R.C.S. Eng., L.R.C.P. Lond., of Domain, Mullion, Cornwall, last surviving son of the late Colonel Musgrave, 5th Bengal Cavalry.

WALLACE.—On Sept. 5th, at Howard Lodge, Newport-road, Cardiff, Thomas Wallace, M.D.R.U.I., J.P.

WARREN.—On Sept. 2nd, following an operation, Alfred Castle Warren, M.D. Camb., L.R.C.P. Lond.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

THERMAL ADJUSTMENT OF MAN AND ANIMALS TO EXTERNAL CONDITIONS.*

By Sir Charles J. Martin, C.M.G., M.B., D.Sc., F.R.C.P. Lond., F.R.S.,

RECTOR OF THE LISTER INSTITUTE OF PREVENTIVE MEDICINE; PROFESSOR OF EXPERIMENTAL PATHOLOGY IN THE UNIVERSITY OF LONDON.

LECTURE II.

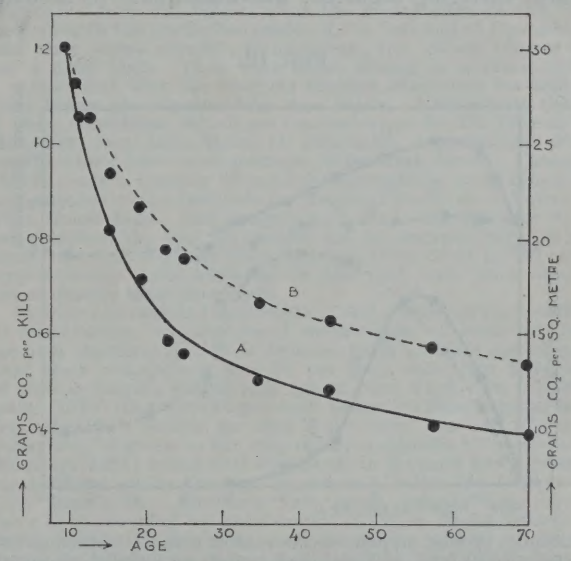
CHEMICAL synthesis on a large scale is confined to ants. It is reductive in character, the requisite ergy coming from sunlight. In animals, on the whole, e reverse oxidations occur, most of the energy nning down to heat. In all living cells this slow idation of foodstuffs takes place under the influence catalysts at a comparatively low temperature. terposed in this chain of irreversible oxidations e reversible chemical mechanisms which catch d store some of this slow downward flow of energy, e most notable and best-studied being muscle. muscle cell is like an accumulator on an electric rcuit in which the electrical energy is otherwise nning away to heat. It stores some portion of it d this portion can subsequently be suddenly let ose to do work. By appropriate arrangements a oportion of this work can be utilised outside the ll but most of it is lost, and the maximum efficiency the most practised muscular act is only about per cent.

Regulation of Temperature by Varying roduction: The Source of Animal Heat.

Of recent years cellular oxidations have been much udied outside the body, notably by Batelli and ern, Harden and Maclean, Thunberg, Warburg, els and Grafe.† That the auto-oxidations occurring an emulsion of tissues in a pot are always the me as occur in the body is, however, unlikely. parated from the body, the cells of all the different gans and from all sorts of animals, use weight for ight very much the same amount of oxygen at the me temperature, whereas in their normal circum- nces their rate of combustion is quite different d, generally speaking, much less. Isolated, auto- idation seems to run riot, normally to be controlled. is held by Grafe that this control, which he calls 'damper action," is brought about in some obscure y by means of the sympathetic nervous system. The rate at which oxidation takes place in resting ls with their circulation intact has been extensively udied by the experimental procedures introduced by rcroft and Brodie (1906), and for our knowledge on e subject we are indebted to them and their many ciples. The method depends upon the determination the oxygen in the blood entering and leaving the rticular organ and the rate of the circulation. e principal results are collected by Loewy (1925) his article on the metabolism of individual organs. Different tissues vary a good deal in the rate at hich they use oxygen. Of all the tissues examined, ting muscle uses least and kidney most, weight for ight. The results of different observations vary considerably, but may be summarised by saying that the heat production of a kilogramme of resting muscle is about one large calorie per hour, of liver, pancreas and submaxillary gland, about eight and of kidney 25 kilocalories. Although this has not been satisfactorily established for isolated tissues, the oxygen utilisation of the whole body varies much with age. This is well illustrated by Fig. 9 which is a graph drawn from observations by Sondén and Tigerstedt (1895).

Six to twelve persons of age groups ranging from seven to seventy were enclosed in a large respiration chamber of 3,370 cubic feet capacity for two hours, and the carbon dioxide produced was determined each half hour. The temperature of the chamber was 18 to 20° C. and the individuals were resting. As may be seen from the lower curve of the chart, the combustion rate at seven years of age is, weight for weight of body, twice that at 25 and three times that at 70 years of age. The upper curve shows the same relation reckoned on the basis of body surface. It will be obvious why, apart from their greater activity, children want so much to eat!

FIG. 9.



Influence of age on combustion-rate of man. Upper graph, grammes CO_2 per sq. metre body surface; lower graph, per kilo body-weight, according to age-grouping. From observations by Sonden and Tigerstedt (1895).

The resting gaseous metabolism is also increased by the intake of food. The warming effect of a good meal is familiar to all. This is not due to the extra work performed by the alimentary canal, for plenty of work can be supplied for the stomach and intestines to do by filling the stomach with agar, but this does not appreciably increase the utilisation of oxygen It is a specific effect of food and the explanation for it is still far from clear. The three varieties of food are effective, but with proteins the increased combustion is greater and lasts longer. Fig. 10 illustrates this well-established fact. It is from an experiment by one of my pupils who is an unusually good subject for observations on metabolism. In her case, 600–700 calories in the form of either carbohydrate or protein produced about 30 per cent. rise in the rate of oxygen consumption. With the carbohydrate, the rise occurred more rapidly but lasted less than half the time, so that the total effect is about a third.

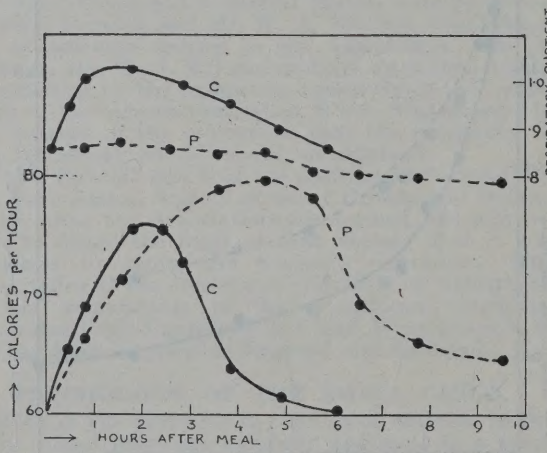
* The Croonian Lectures delivered before the Royal College of ysicians of London on June 12th, 17th, and 19th. Lecture I. s published in THE LANCET last week.

† The literature is reviewed by Grafe, Biochem. Zeitschr., , 102.

EVIDENCE FOR CHEMICAL REGULATION IN MAN.

Lavoisier (1778), who, by his discovery of oxygen explained the nature of combustion, also proved that oxidation was the source of animal heat, and showed that a cooled man used more oxygen than a warm one. One hundred years later, Voit (1878) studied the effect of external temperature on the rate of combustion of man and found that with a clothed man in still air the external temperature could be varied from 10–25° C. without appreciable change in the amount of carbon dioxide he produced, but as soon as the rate of heat loss increased beyond this, he began to burn more fuel and ultimately to shiver. Speck (1883, 1885) measured the carbon dioxide he produced whilst sitting in a cold bath, but as long as he was able to keep absolutely still he found no significant rise. Rubner (1900) who obtained results very similar to those of Voit was of opinion that the amount of muscular movement, until shivering occurred, was inadequate to account

FIG. 10.



Influence of food on combustion-rate of man. C = effect of 700 calories in form of starch and lactose on metabolism (lower curve) and respiratory quotient (upper curve). P = effect of 650 calories in form of raw steak. Observations by Mrs. Y. M. Gibbs. Weight, 59·2 kilos; height, 177 cm.; age 24. After fasting 14 hours.

for the increased combustion observed and concluded that the extra combustion took place in muscles without motion and in other organs, especially the liver.

In 1890 Loewy (1890) measured the oxygen used over a short period by a number of people before and after removing their clothes and concluded that in all cases in which an intelligent person was completely relaxed, the utilisation of oxygen was no greater, unless they shivered, when it might increase 50–100 per cent. Various criticisms were levelled against this conclusion and six years later Johansson (1896) performed a number of experiments on himself and another, with and without clothes, in a chamber at 15–20°. The experiments lasted one to two hours. Johansson arrived at the same conclusion at Loewy—viz., that unless shivering occurred, there was no increased formation of carbon dioxide; coincident with shivering the carbon dioxide output rose 70–80 per cent. and even to three times its former value. Johansson's results were criticised by Rubner, but not upset, and physiologists settled down for 25 years to the general belief that, unlike animals, man relied upon physical regulation until the fall in temperature of his skin was sufficient to evoke shivering.

In 1914 Leonard Hill recorded some experiments and Flack had made on the respiratory exchange eight individuals, firstly, in the laboratory, and th on the roof of the London Hospital, with a co breeze blowing but at a temperature not cold enou to cause shivering. From Hill's data, I find that t mean oxygen consumption outdoors was 1·4 tim what it was indoors. These observations we published in the Reports of the Local Governme Board and escaped the attention they deserved unt in 1921 Campbell, Hargood-Ash and Hill repeat them, with similar results, and discussed th significance in a paper in the *Journal of Physiolo*. Hill's experiments have been criticised on the groun that the subjects were neither at complete rest n fasting. This, however, applies to the experiments comfortable surroundings as well as when expose. I have no doubt of the substantial accuracy of Hil conclusions, though the increases in metabolism obtained are perhaps somewhat high. I have fou a rise in oxygen consumption in most subjects soon as the surface of the body became uncomfortab cold. We both used the Douglas-Haldane metho but in my experiments the subjects were in the po absorption state and had been at complete rest f some hours, generally all night.

The oxygen consumption in a warm bed was first taken a standard of reference. Then the clothes were removed a windows opened and a cool winter's breeze (temperatu 8–10° C.) allowed to play upon the nearly naked body. T rate of cooling was, therefore, greater than in Hill's cloth subjects. After half an hour's interval, during which t skin temperature of the thighs fell to 25–26° C. and "goo flesh" appeared on the limbs, the respiratory exchan was again measured. Four individuals were the subjects the experiments, two thin and two well covered. The increa in metabolism varied from 9 to 17 per cent. It was m in the thin persons. On two occasions the experiment w extended until shivering seemed imminent, as there was tremor on the respiratory rhythm and slight flickering some muscle bundles. In these cases the increase amount to 26 and 30 per cent. respectively.

Similar observations have been made by Franke a Gessler (1925). They determined the effect of removi their clothes in a room of which the temperature was 15°. They found their oxygen combustion increased 12 to 24 p cent. on different occasions although they did not exp themselves sufficiently long to shiver.

Gessler and Laves (1925) made the further interesti observation that 0·3 g. of pyramidon or 30 c.cm. of alcol obliterated this chemical response after removing cloth

When Franke and Gessler placed their legs in cold wat a 10 per cent. rise was noticed, but when they did the sa to a patient with anæsthesia from a transverse myeli there was no rise in metabolic rate and the body temperatu fell 0·5° C. From this they conclude that cold to the sk is a more effective stimulus to chemical regulation than a f in temperature.

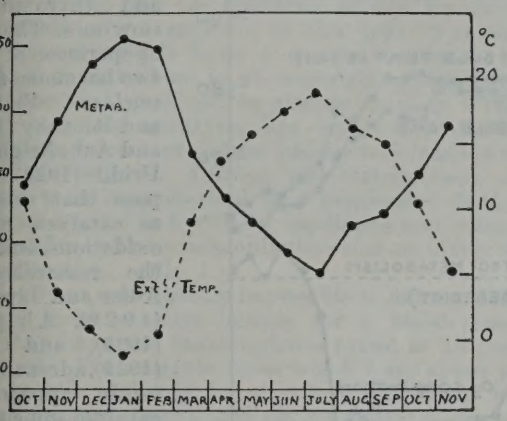
Liljestrand and Magnus (1922) made some interesti experiments which are generally taken as supporti Johansson. They immersed themselves in baths at 32° containing carbon dioxide super-saturated water at Moritz. The carbon dioxide prevented the normal constr tion of the skin vessels, in fact, dilated the capillaries a abolished the uncomfortable cold feeling, although the bo temperature sometimes fell 1° C. Nevertheless, they fou that they did not shiver nor did their oxygen consumpti increase unless the temperature of the bath were lowered 29° C. These experiments do not seem to me to be nec sarily in favour of Johansson's rigid conclusion, but indicate that the stimulus to enhanced combustion is mo readily produced by a cold skin than a drop of 1° C. in blo temperature.

How, then, are we to explain the inconsistenci between the experiments of the Swedish school a others. Gessler suggests that Johansson must ha hypnotised himself and his companion, for Gessl and Hansen (1927) have shown that suggestion ca inhibit contraction of the vessels to the skin a shivering, even though the body temperature fal from the consequent heat loss. I have no dou that the real explanation for these divergent vie

that different individuals vary in the readiness with hich they respond by chemical regulation and that e discrepancies are especially likely to be encountered hen the experiments are of short duration. Pre-mably the larger the number of people experimented on the more will this become apparent. Gessler, ho has had in his clinic more experience than can claim, emphasises that whilst the same person sponds in a remarkably consistent way, he experiences eat differences between individuals.

An interesting fact first brought to light by the servation of Hill and his colleagues (1922) is that tients undergoing open-air treatment not only

FIG. 11.



Mean monthly metabolism and mean monthly temperature. Gessler (1925), observations on himself.

hibit very considerable increase in the respiratory change at rest over that occurring when they are pt indoors at 70° F., but that the effect persists for ne time. Just as the effect of a cold bath is obvious e hour afterwards, so the effect of a month's exposure nifests itself, so I am informed by Hill and Campbell, about a fortnight after a child is brought indoors. this is the case, a seasonal influence upon basal tabolism should be discoverable. Benedict (1915), o denies chemical regulation without shivering, orts casually that one of his trained subjects had an per cent. higher respiratory exchange in winter than summer, but an experiment by Gessler is more minating. He observed his oxygen consumption the same hour every third day throughout the year er reclining for half an hour. The results of this ended experiment are to be seen in the graph g. 11) in which the mean monthly basal metabolism l the mean monthly air temperature are plotted ainst months of the year. His day to day variations metabolism amounted to only 3 per cent. It will seen from the graph that the mean oxygen con-nption at rest varies inversely with the mean external perature and is 10 per cent. higher in January n in July, notwithstanding an increase of 10 lb. weight during the summer.

So far we have been considering more particularly effect of a cold skin in raising combustion rate. will now examine whether the reverse occurs l in warm climates basal metabolism is diminished. is would seem advantageous, and the earlier ervations on the effect of external temperature on respiratory exchange of man by Rubner and his istant, Wolpert (1898), indicated that it occurred. servation of a possible depressing effect of a warm n upon metabolic rate is easily obscured by an rease in oxygen consumption should the body temperature rise. Plant and Wilbrand (1922) got over this difficulty in an ingenious way and found that when a man or dog was made hyperthermic and then allowed to cool down until his temperature was again normal, the man's basal metabolism was reduced 8 per cent. and the dog's about 30 per cent. They conclude that this "gegenregulation" was in operation during the hyperthermic period but was masked by the direct effect of rise in temperature on cell combustion.

Basal Metabolism in the Tropics.

If the continued absence of the stimulus of cold upon the skin leads to a depression of gaseous metabolism below that found in what we are accustomed to regard as comfortable surroundings, it should be manifest in Europeans living in tropical countries.

Eijkman (1896) was the first to measure the respiratory exchange of Europeans in the tropics (Java), and came to the conclusion that it did not differ significantly from that of persons of similar size, age and weight in Berlin. I have calculated from his figures what the metabolism should be according to the prediction tables of Du Bois and of Benedict, and they agree closely; if anything, the values observed are a little high. They were taken sitting in a chair, and I cannot find that the subjects reposed absolutely for some time before the observations were made. I anticipate that if these conditions, which are insisted upon by Du Bois and Benedict, had been those of Eijkman's experiments, his results would have been perhaps 10 per cent. lower. Young (1919) made a number of careful observations upon himself and another at the Institute for Tropical Medicine in Townsville, Queensland. The analytic part of the experiments was unexceptionable, but his results are so unexpectedly high that I can only suppose the subjects of them must have been hyperthermic, even allowing for the fact that they were taken shortly after breakfast.

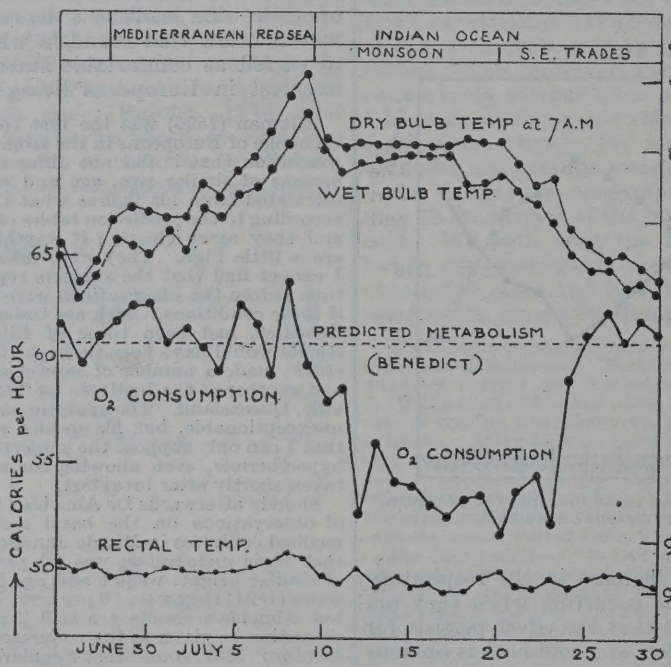
Shortly afterwards De Almeida (1921) published the results of observations on the basal metabolism of some of his medical confrères in Rio de Janeiro, from which it appeared that their metabolism was 20 per cent. less than persons of similar height, weight and age in New York. In a later series (1924) they were 16 per cent. below Du Bois' standards. but Almeida's results are still 2 per cent. too low if consideration be given to the respiratory quotients he obtained. Montoro (1921) found that Spaniards in Havana had a basal metabolism, on the average, 14 per cent. below the accepted U.S. standards. Similarly low basal metabolism rates have been recorded by Sundstroem (1926) in North Queensland, and by Hafkesbring and Borgstrom (1926) in New Orleans. Hindmarsh, who examined 76 subjects in Sydney, New South Wales, found an average diminution of 9 per cent. in men and 10 per cent. in women. Lastly, the question has been examined with extraordinary care and thoroughness by Berkhout (1929) in Eijkman's old laboratory at Weltevreden, Java. The mean of his observations on twelve Europeans represents a 10 per cent. diminution in metabolism, which is twelve times the probable error.

When the individual observations of all these different observers are scrutinised, considerable variations are to be found among them. Therein rests, I think, the cause of the divergence of opinion. Individuals react differently: some reasonably reduce their resting rate of combustion in warm climates, others do not.

In 1923 I took advantage of a voyage to Australia, during the time of year when I should experience the hottest weather in the passage through the tropics, to see whether I made any attempt to moderate my combustion rate. A voyage on a liner possesses signal advantages for such an experiment, as one can order one's life with the utmost uniformity. I took the same quantity and quality of food at the same intervals daily, and the same amount of exercise throughout the voyage. At 7 A.M. each morning, before I stirred from my bed or took food or drink, I breathed into a Douglas' bag for 15 minutes. I at once measured the volume of air breathed, removed samples into syringes over mercury, and analysed them during the morning. From the volume of air breathed and the oxygen removed from it and the

carbon dioxide it had gained, the volume of oxygen, at 0° and 760 mm. pressure, used per minute and the respiratory quotient were arrived at. From these data the number of calories produced per minute was calculated from the oxygen consumed and the respiratory quotient (Zuntz and Schumberg (1901)). The results I obtained are shown graphically in Fig. 12, in which the rate of heat formation in calories per hour is plotted for each day. The temperatures of the dry and wet bulb thermometers in °F., observed in the port-hole of my cabin with a good breeze coming through, is recorded above, and the rectal temperature on rising is plotted below. The abscissa represents the 35 days of the voyage. The temperatures recorded usually represent the minimal temperatures endured, for 7 A.M. is nearly the coolest time of the 24 hours in the tropics.

FIG. 12.



Daily observation of basal metabolism of C. J. M. during a voyage from London to Australia, June–July, 1923, and daily record of the temperatures of the dry and wet bulb thermometers at 7 A.M.

I also made daily determinations of the basal metabolism of a medical friend who was a fellow passenger. These observations, too, were made before he arose from bed. He performed his part of the investigation most excellently, but he was an unsuitable subject. I was not able to control his food supply and habits as I was my own, but I do not think that was the explanation of the fact that his consumption of oxygen varied 10–15 per cent. from day to day, and it was not obvious that warm weather had any other effect upon it than to vary it more.

You will notice that within a few days of encountering hot weather my metabolism, on awakening in the morning, began to fall, and that the minimum was not reached until five days after I began to feel the heat. In other words, it was not a quick adjustment. The same happened on encountering the trade winds, but in this case the reverse response was quicker, and accompanied by an urge to activity and a greatly increased output of urine. The maximal difference between the oxygen consumption during the hot and cool periods only amounted to 12 per cent.

We may now consider how an adjustment which persists is likely to be made. If it were an alteration in the rate of combustion in the muscles, liver and other glandular organs, brought about reflexly by stimuli coming from the nerves of temperature sensation, shortly after the particular stimulus ceased the rate might be expected to return to the normal, for the rapidity of the response to the stimulus of cold by increased heat production and its prompt cessation on removal of the cutaneous stimulation was shown by Pembrey (1893). The explanation that seems to me most probable is that we have here an example of the indirect method of varying heat production through the greater or less activity of t adrenals, and particulary the thyroid gland, the i portance of which in thermoregulation is so strong urged by Cramer and by Cannon.

The calorigenic action of adrenalin is rapid, that thyroxin slow, but persistent. According to Au Bright and Uridil (1922), adrenalin produces effect upon oxygen utilisation in minutes which tak days with thyroxin. Plummer and Boothby (192 found the maximal effect of thyroxin occurr ten days after intr venous injection. this account adr nalin would be usef for rapid adjustme and thyroxin f slow ones. The mo of operation of the two hormones is st unclear. Plumm and Boothby (192 and Aub, Bright a Uridil (1922), su pose that they a as catalysts to c oxidations, and fro the researches Adler and Lipschi (1922), Ahlgr (1925), and Eul (1929), adrenalin c tainly appears catalyse some of t auto-oxidation pr cesses in cells moved from t body.

Whilst agreei with Cramer a Cannon that var tion in cell co bustion, due varying activity the adrenals a thyroid, plays a part in thermal adjustment, a believing that an adaptation of the activi of the thyroid gland is the cause of persisti increase or decrease of resting metabolism aft exposure to cold or warmth, I think they incline exaggerate the part ordinarily played by this humo method in thermal adjustment. The experiments Hildebrandt (1921) on rats, Grafe and Redwitz (192 on dogs, and Isenschmid (1922) on cats show that animal some time after thyroidectomy can regula its temperature by varying production of he similarly to a normal one, even when the dorsal co is severed. True, it starts from a lower base lin but failure to compensate is not manifested until t rate of heat loss is considerable. As Isenschmid poin out, the thyroid is not the only instrument at t disposal of the organism for thermal adjustmen it has a whole orchestra to play upon.

GLASGOW LOCK HOSPITAL.—The average stay the 360 in-patients last year was 58·5 days, against 60·2 1928. The average age was 18·1; in the preceding year was 18·5. New dispensary cases numbered 558, a fall of 4 In the in-patient department there were 95 childre 27 fewer than in 1928; 57 of them were infants. I Madeline Archibald, the assistant medical officer, has be appointed whole-time medical officer to see patients who a diffident in going to the clinics at the dispensary, and give regular lectures in the hospital to persons ov 16 years of age, other than students and post-graduates.

CONGENITAL ARTERIOVENOUS FISTULÆ.

By Dean De Witt Lewis, M.D. Illinois,
SURGEON-IN-CHIEF TO THE JOHNS HOPKINS HOSPITAL, BALTIMORE, AND PROFESSOR OF SURGERY IN THE UNIVERSITY SCHOOL OF MEDICINE.

The arterial rankenangioma (racemose or cirsoid erial aneurysm) has been defined as a vascular mour in which all the arteries of a region, including ir finest branches—often communicating with each ier—are dilated and tortuous. Secondarily, the ns, according to most authors, are involved. agner believes that the formation of new vessels is aracteristic of an angioma of this type, that the wly formed vessels have a decided tendency to wth, and that there is an eccentric hypertrophy the vessels of small calibre already existing. The erial racemose aneurysm has been differentiated m lesions known as diffuse phlebarteriectasis and fuse phlebectasis. Diffuse phlebarteriectasis is posed to be characterised by a progressive dilata- n of an arterial bed with its capillaries and veins; ile in diffuse phlebectasis only the veins are involved the dilatation. (Fig. 1.)

Clinically, it is frequently impossible to differentiate ween these vascular lesions, for a blood-vessel on may have the characteristics found in all just ntioned. For example, cases which I am about to ort would probably be classified differently by ferent authors; but as they are congenital in origin, l present the signs and symptoms of a communica- n between the arteries and veins without the ervention of a capillary bed, I believe that they be properly regarded as congenital arteriovenous urysms.

According to Osler, arteriovenous aneurysms strate better than any other disease how borderless the boundaries of medicine and science. The treat- nt of arteriovenous aneurysm, whether congenital traumatic, is essentially surgical, but the shunting arterial blood directly into the veins gives rise certain phenomena which are of interest to the siologist, and produces signs and symptoms ch attract the attention of those practising rnal medicine.

Lewis and Drury state that—

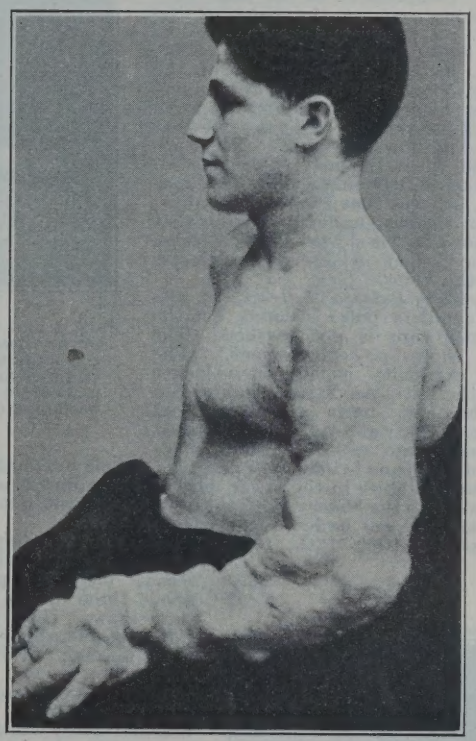
> If blood leaks from the arterial system through channels r than the natural pores provided by capillaries, and s out at a sufficient rate, such leakage will change the rial pressure. So far as many physical signs are concerned eems to be a matter of indifference whether the leak rs back into the ventricle, into the pulmonary artery ugh a patent ductus arteriosus, or into a vein through a ct anastomosis. The leak produces certain changes in rial pressure which are common to all these pathological ditions. That the arterial changes should be identical ll respects in these three separate conditions, however, arcely to be expected, for the leakage in aortic regurgita- is confined to the diastole, while in arteriovenous stomosis and patent ductus arteriosus it occurs through- the whole cardiac cycle. A leakage into a large vein nto a pulmonary artery may also produce different fects by altering the pressure in these vessels rather than he left ventricle. Despite this there will remain on the rial side certain common manifestations of leakage, the phenomena accompanying such leakage in one dition may illuminate similar phenomena occurring in the er."
>
> Arteriovenous anastomoses, when free, are associated characteristic signs of aortic reflux in the systemic rial system—namely, low diastolic pressure, large pulse sure, collapsing pulse, capillary pulsation, and a difference ne arm-leg systolic pressure."

The statements of Osler, and Lewis and Drury e made after a study of traumatic and experimental arteriovenous fistulæ. The lesion, which must be treated surgically, has many of the signs and symptoms of cardiac disease.

Five Recently Observed Cases.

Congenital arteriovenous fistulæ may present many of the signs of the traumatic. They offer problems, as far as therapy is concerned, which are not encountered in the traumatic variety. The congenital fistulæ also suggest a close relationship to cirsoid aneurysms, rankenangioma, and other types of hæmangiomas encountered in works dealing with surgery and in surgical practice. I should like to discuss the following cases which I have recently observed.

Fig. 1.



Case of phlebectasis reported by Reid. Large dilated veins without any of the signs or symptoms of an aneurysm.

Case 1.—W. R., male, aged 21. This patient entered the Johns Hopkins Hospital Oct. 3rd, 1929. From birth small, painless, collapsible swellings were noted in the right upper extremity of this patient. These increased in size with growth. The location of these and their general appearance may be seen in Figs. 2 and 3. When the patient was about 12 years of age a distinct bruit developed in the extremity which the patient could hear. This bruit has persisted.

Upon *examination* the pectoral region and shoulder on the right side appear larger than on the left. The veins are also much more prominent on this side. A large collapsible swelling is found upon the outer side of the arm just below the deltoid, another in front of the elbow on the inner side, and several in the forearm. A scar is found upon the anterior surface of the forearm just above the wrist on the radial side. At this point one of the large veins which seemed about to rupture was dissected out. Upon palpation a systolic thrill is felt over the suprasternal notch; in the neck as high as the angle of the jaw on the right side, and over the vessels of the arm down to the elbow near a large vein. Here distinct systolic and diastolic thrills are felt. These are felt in the forearm almost to the wrist. A distinct systolic and diastolic bruit is heard over the large purring vessel in front of the elbow. This is transmitted into the forearm. A systolic bruit is heard over the arm, along the vessels

in the neck up to the angle of the jaw on the right side, and below the manubrium.

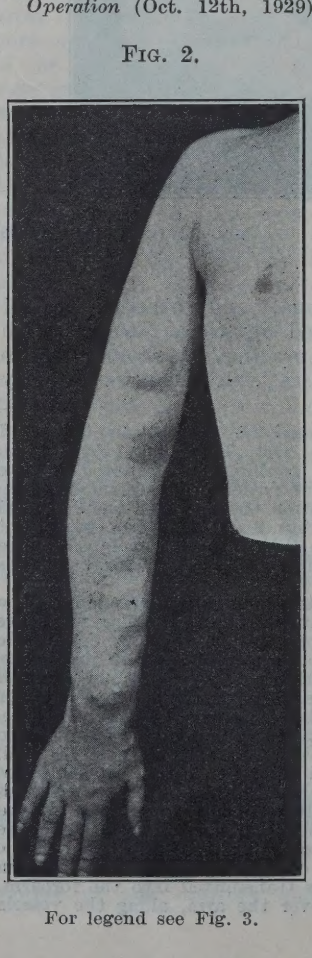
Bradycardiac Reaction.—The heart does not seem to be increased in size, but definite vascular phenomena are noted when the brachial artery is compressed at any point down to the large vein at the bend of the elbow. When the brachial artery is occluded marked slowing of the pulse is noted almost immediately. The initial slowing is accompanied by some irregularity. For example, the pulse would be slowed by 18 or 20 beats when the artery was closed. The pulse decreased in one instance from 89 to 70 beats. This slowing could be elicited at any time. Compression of the large subcutaneous vein at the bend of the elbow in which the machinery-like thrill was felt caused slowing of the pulse, just as did occlusion of the artery. The blood flow in the extremity before the artery was compressed was 3 litres per minute. This is somewhat low. The flow rose to 3·45 litres per minute when the artery was closed. Dr. Harrop, who made these examinations, believes that there is no indication in the case under discussion that the blood flow is slowed after occlusion of the artery which communicates with the veins.

Capillary Pulse and Heart.—A distinct capillary pulse is noted, but the Duroziez sign is not marked. The heart shows no enlargement. The right extremity is one inch longer than the left. An X ray examination of the soft parts shows marked changes. The right radius is perforated by many large vessels. The architecture of this bone is indicated in Fig. 4. It is much altered. A healed fracture in the lower third of the radius is shown. According to the history this fracture occurred without much violence, and was undoubtedly pathological.

Operation (Oct. 12th, 1929).—The brachial artery was first exposed in the internal bicipital pulcus, about three inches above the elbow. The artery was considerably larger than normal. Its walls were thin. The venæ comites were large, but did not pulsate. The brachial artery was doubly ligated. The large vein at the bend of the elbow in which the machinery-like thrill was felt was next exposed. This was an enormously dilated median basilic vein. Approximately five inches of this vein were removed. It was first ligated where the deep communicating branch joins the radial, and was then dissected out proximalward to beyond the point where the superficial ulnar unites with the median basilic to form the basilic vein. The thrill ceased when the brachial artery was ligated, but the median basilic vein and the venæ comites did not collapse. Following the operation the patient complained of considerable pain in the hand. I believe this due to thrombus formation. Thrombi can be distinctly felt at the points where the pain is most severe. An especially large thrombus can be felt on the posterior surface of the forearm about the middle near the radial side.

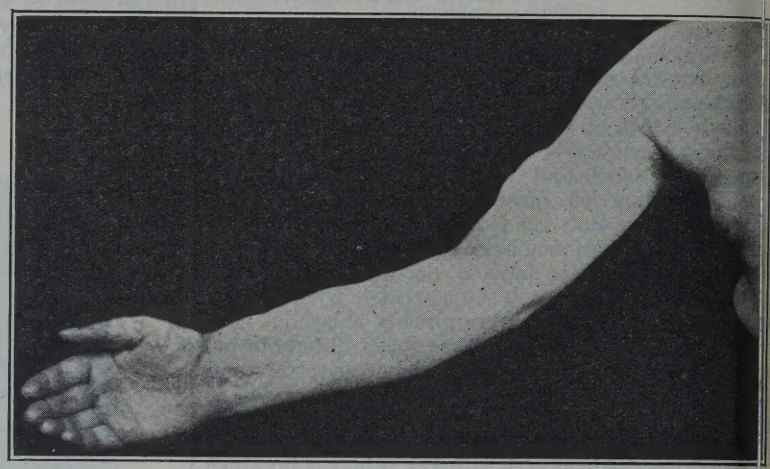
When the patient was discharged from the hospital, Nov. 16th, 1929, a distinct bruit could be heard abo the elbow and over the lower third of the humerus on outer side. A distinct thrill could be felt there. Thrombo had occurred in many of the vessels, even in the sma

FIG. 2.



For legend see Fig. 3.

FIG. 3.



FIGS. 2 and 3.—Photograph of Case 1 in two positions illustrating the locat of the dilated veins. The most intensive systolic and diastolic thrill and machine-like murmur were felt and heard at the bend of the elbow on the antero-internal s Compression of the brachial artery or the large vein was followed by an alm immediate fall in the pulse-rate, the pulse slowing as much as 20 beats. T beginning of slowing was associated with some irregularity.

vessels of the hand. Slowing of the pulse no longer follo closure of the brachial artery by compression. The si associated with an arteriovenous fistula had disappea to a considerable extent. A distinct bradycardiac reac was noted in this aneurysm following closure of the brac artery, but no cardiac changes.

CASE 2*.—A. L., white, female, was admitted to Johns Hopkins Hospital, Sept. 30th, 1925. She stated four weeks before she had fallen and struck her arm aga the corner of a table. After two hours her arm be to swell. Sharp pain was experienced. Later this bec dull and throbbing. The patient also complained of a feeling in the little finger, and when the pain came on she as if she must flex her finger. The right forearm appe larger than the left (Fig. 5), and the skin of the forearm hand was blue. A decided swelling was found on the in side of the upper third of the forearm which extended to lower part of the arm. The swelling is soft and compress and feels like a mass of worms beneath the skin. Within mass are swellings which collapse on pressure. A dist pulsation of the veins is noted. At the bend of the el on the inner side a machinery-like thrill is felt. (Fig. When the brachial artery is compressed the thrill disappe Blood pressure taken in the right arm is 130/90—left, 100 There are no heart changes, and no bradycardiac reac following compression of the artery.

Operation (Nov. 10th, 1925).—The brachial artery exposed in the internal bicipital sulcus in the lower thir the arm, and a rubber armed artery clamp placed upo Two aneurysmal dilatations of the basilic veins and radicles were then exposed. (Fig. 7.) Here the machinery-thrill was of maximum intensity. Posterior to the inte condyle an artery, apparently a branch of the poste ulnar recurrent which communicated with these dilatati was found. This was divided and the veins involved disse away. The thrill disappeared, and there has been no ret A mass of veins is still found in the skin of the arm poster in the lower third. This congenital arteriovenous fis had a small communication. There were no heart cha and no bradycardiac phenomenon following occlusion of brachial artery.

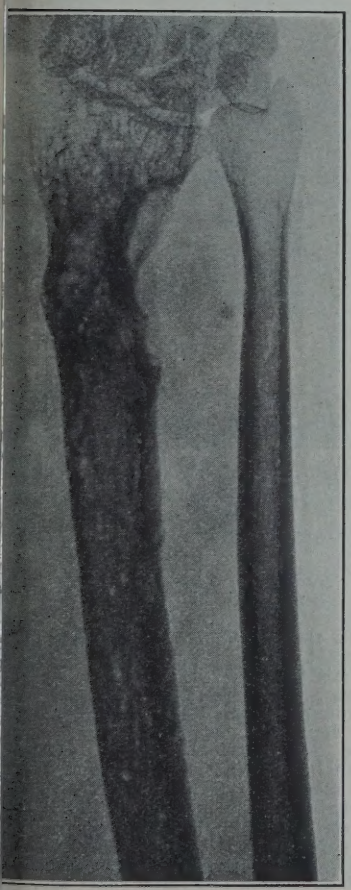
CASE 3.—This patient, a coloured male child, was admi to Harriet Lane Home, April 7th, 1923, when one day At birth a tumour was noted in middle and upper par right arm which presented anteriorly. (Fig. 8.) This vasc tumour extended from just above the insertion of the del down toward the elbow. The tumour is soft, round, wi surface somewhat ulcerated. It is the size of a small tom measuring 6·5 cm. in its greatest diameter. The bas

*This case has been reported—Kongenitale arteriove Fisteln, Deutsch. Med. Woch., 1926, lii., 639.

)vered by normal skin. The surface is apparently covered ith thin epithelium. There is a stellate scar on the surface hich probably resulted from a hæmorrhage which occurred ıortly before the child was born. This mass is soft, almost ıctuant, and changes in size with respiration rather than ith the heart beat.

In the axilla a soft mass of veins is found. The veins are ısily closed by pressure. Beneath the skin, near the tumour, ›e radiating veins of large calibre, which are thrombosed. ıall red macules and telangiectases are seen in the skin ›out the tumour. The apex beat of the heart is in the cillary line 3·5 cm. to the left of the nipple. A harsh ystolic bruit is heard at the apex. It is of maximum tensity here. It diminishes in intensity toward the right de and is not transmitted to the back. This bruit is also eard in the vessels of the neck. As the right axilla is ›proached another systolic murmur is heard. This increases intensity as the tumour is approached. Over the tumour distinct to-and-fro machinery-like murmur is heard. his is transmitted some distance beyond the tumour. There no radial pulse. The extremity is œdematous. X ray :amination reveals a wide mediastinum. To the left of the ediastinum an abnormal pulsation can be made out. This ılsation becomes less marked and finally disappears when ıe brachial artery at the base of the tumour is compressed. The child died three days after admission to the hospital. he autopsy findings were: cavernous angioma of the right m with wide communications between arteries and veins. ›ngenital arteriovenous aneurysm. Dilatation of the teries and veins proximal to the aneurysm. Patent ductus teriosus and foramen ovale; cardiac hypertrophy, œdema the face and neck; generalised lobular pneumonia.

FIG. 4.



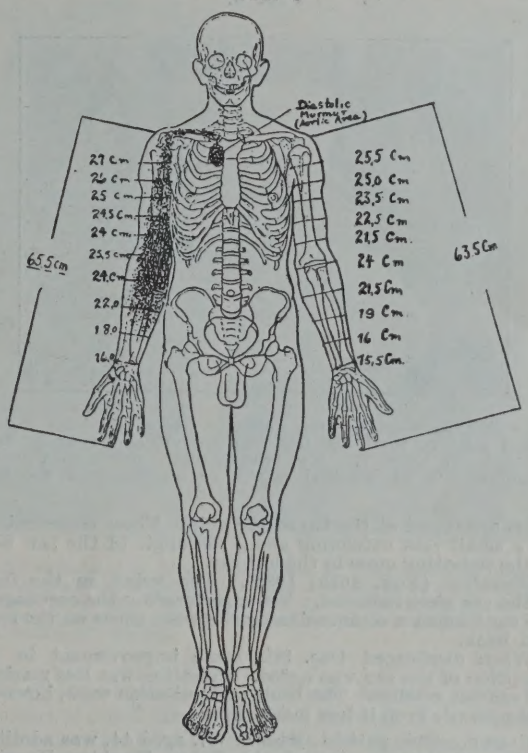
ray of the bones of the forearm of patient mentioned in Figs. 2 and 3. The radius is perforated by many large sinuses. The site of a pathological fracture is indicated in the lower part of the radius. Anastomoses between veins and arteries in these cases render cure difficult, because it is impossible to separate the communications between the veins and arteries in the bone.

The tumour in this case (Fig. 9) suggests a definite relationship between different types of angiomas and congenital arteriovenous fistulæ.

CASE 4.—Dr. Max Ballin (Detroit) has permitted me to report the following interesting case. Since childhood the veins of the dorsal surface of the left hand had been prominent. (Fig. 10.) The middle and ring fingers were puffy and somewhat weaker than the corresponding fingers on the right side. The hand perspired profusely. Dr. Ballin, in writing to the patient's doctor, said, "P. C. is suffering from a so-called cirsoid aneurysm of the middle and ring fingers of the left hand. This is a very interesting condition to me, as I have seen the affection several times. Unfortunately this is quite a serious matter, as the aneurysmal condition usually extends into the whole hand and travels up the arm. We should try to stop the process in Mr. C.'s case by ligating off the communication between arteries and veins in the neighbourhood of the radial artery over the wrist. The communications are usually multiple and sometimes recur. Please note the increased growth in length of the affected fingers, the profuse sweating of the hand, the aneurysmal bruit over the palm and over the radial artery. I would not promise that ligation will stop the process, but it should be tried. It may be that amputation of the two affected fingers will have to be added."

Operation.—A six-inch incision was made over the radial artery from three inches above the wrist to the middle of the

FIG. 5



Indicates difference in size of the two extremities. Dots indicate the distance to which the murmur was transmitted.

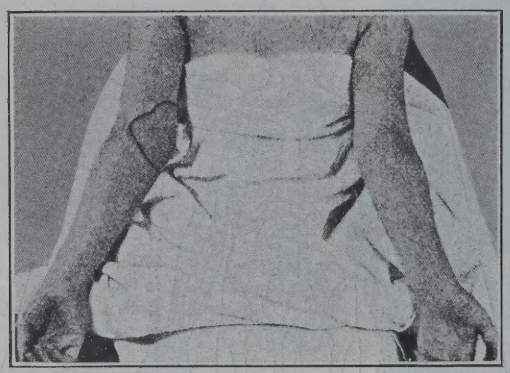
palm. Large cirsoid veins surround and communicate with the radial artery. These communicating branches were isolated and ligated near the artery. The median nerve was well exposed and protected. After the tourniquet was removed, it was noted that, while the pulsations in the veins of the dorsum of the hand are less, the pulsation is marked in the veins of the hypothenar eminence and in the vessels on the ulnar side of the hand. Varicosities were found on the ulnar veins up to the middle of the forearm. These communicated with branches of the artery. The vessels were resected for a distance of about two inches. Pulsation in the large veins on the dorsum and in the palm of the hand, and in the two affected fingers ceased.

This operation did not stop the process, and when the patient was last examined a distinct bruit was heard over the dorsum of the third and fourth metacarpals, and dilated veins were present over the fingers. The final result in this case cannot be given, for the patient can no longer be traced.

CASE 5.—I am permitted to report this case through the kindness of Dr. Charles Bagley, who gave me the notes and performed the operation. R. K., female, aged 26. When 4 years old four small lumps appeared on the left auricle. No history of any injury. Patient noticed that the lesion was collapsible. She noticed that they pulsated. They were painful at times. The masses have grown larger during the past 22 years until now the whole ear is involved. (Fig. 11.) At times the pain is very severe. The pain comes on in paroxysms which seem to be associated with increase in size of the ear. The patient states that it seems as if something had burst. Pulsation of the whole ear is quite marked, and noise from the masses bothers her. Hearing in this ear has been impaired for the last two years. The ear has increased in size much more rapidly during the past two years. She says that she feels dizzy at times. There has been no headache, nausea, or vomiting. The general physical examination is essentially negative, except that the patient is pale and obviously undernourished. The left ear is as large as a fist. The swelling is quite symmetrical, but more prominent posteriorly than anteriorly. The ear is purplish in colour,

tense, and pulsates with each heart beat. The ear is irregular over the external surface and large distended veins can be seen. In front of the ear, just over the temporal artery, is a small pulsating swelling. Another mass is found over the back of the ear which extends over the mastoid process. A bruit can be heard over the ear. When both carotids are compressed the bruit disappears. It persists when either one alone is compressed. Two small, distended, pulsating

FIG. 6.



Area circumscribed by line indicates point at which systolic and diastolic thrill was felt, and systolic and diastolic bruit heard, in Case 2. No bradycardiac reaction followed compression of brachial artery or occlusion of openings.

veins are found at the tip of the chin. These communicate by a small vein extending along the angle of the jaw back to the pulsating mass in the left ear.

Operation (Nov. 16th, 1929).—The veins on the front of the ear were removed. Veins perforating the cartilage of the ear formed a communication between those on the front and back.

When discharged Dec. 9th, some improvement in the condition of the ear was noted. Pulsation was less marked; the ear was smaller. The bruit and pulsation were, however, still present, even if less marked.

CASE 6.—This patient, Miss Z. W., aged 44, was admitted to the surgical service of the Johns Hopkins Hospital,

FIG. 7.

Dilatation of the subcutaneous veins at the elbow-joint is shown in this figure. The communication between the arteries and veins in this case was by a single branch posterior to the internal condyle. This vessel was apparently a branch of the posterior ulnar recurrent artery. This communication was divided and the brachial artery ligated. The signs and symptoms of an aneurysm have disappeared. A mass of subcutaneous veins (hæmangioma) still remain posterior to the lower third of the humerus in the subcutaneous tissue.

Jan. 23rd, 1930, complaining of pain in the right heel of about three years' duration. The family and past histories have no bearing on the case. The patient had noted that the right foot and lower part of the right leg had been larger than the left foot and leg, but had not paid much attention to this. The first definite evidences of discomfort in the foot apparently developed after the patient had been standi some time watching a parade. The symptoms noted th were intermittent attacks of pain, numbness and swelli across the under surface of the right heel. At first the symptoms could be controlled by strapping the ank Gradually the pain increased, and the patient experienced sensation as if she were stepping upon a bee whenever t heel was placed upon the floor. One year after the ons of symptoms a diagnosis of an arteriovenous aneurysm w made, and electrolysis employed with temporary benefit.

Operation (May, 1928).—Brisk hæmorrhage was encounter at this operation, but it is difficult to determine the nature the operation from the history given by the patient. Duri March, 1929, the symptoms recurred. Electrolysis w again attempted with some improvement, but the symptor recurred, and in October, 1929, a more extensive operati procedure was resorted to. A number of vessels were ligat and excised. The scar of this incision is upon the outer si of the foot, extending distalward from the external malleol and anteriorly and posteriorly to it. The swelling benea the right heel has increased considerably since this operatio and the patient has been unable to place her heel upon t

FIG. 8.

Congenital tumour in a child. All signs and symptoms of a aneursym occurred in this lesion. The child also had a co genital heart lesion. Death occurred soon after birth. T history of this patient is given under Case 3.

floor, and pains are frequently felt through the ankle a heel. The pulse-rate varies from 80 to 100. The blo pressure is 158 over 84. The heart is negative. No brad cardiac reaction can be elicited. Some pitting of the rig ankle is noted. The right foot and lower part of the rig leg are distinctly larger than the left foot and leg, a several small angiomas may be seen. A diffuse swellin 5 cm. in diameter, is found beneath the right heel. (Fig. 1 Although tense, this can be collapsed by pressure. T whole mass seems to be raised by systole. A systol and diastolic thrill can be felt, and a systolic and diasto bruit heard over this mass. The bruit has a rather sha piping or whistling character. A small angioma is fou on the back near the scapula on the right side.

This case presents some interesting features. Evident changes in the leg and foot were noted from birth. Pain a discomfort in the foot developed but three years ago. O might be justified in concluding from the symptoms th an angioma was present from birth, and that the arteri communication was established but three years ago. Th followed standing for some time watching a parade. The ca also suggests the intimate relation which may exist betwe angiomas and congenital arteriovenous fistulæ. The brui can no longer be heard when the vessels behind and abo the external malleolus are occluded.

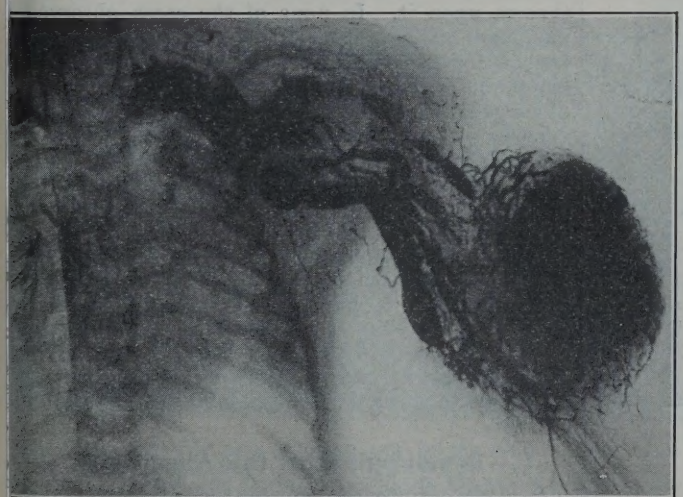
In this group of cases are found most of the clinic phenomena and peculiarities of congenital arteri

enous aneurysm. In the first case the bradycardiac eaction which follows occlusion of the artery, whose ranches communicate directly with the veins, or the losure of the communications between arteries and eins, was striking. In the second case no radycardiac reaction was noted. In oth the second, third, and sixth cases he relationship between hæmangiomas nd congenital arteriovenous aneurysms s suggested. The destructive nature of ome lesions of this type is illustrated by he fourth case. The fifth case presents he clinical picture of this type of lesion ccurring about the head and face, to hich the term cirsoid aneurysm is equently applied.

The Bradycardiac Reaction.

Not infrequently Branham is given the redit of having first observed the marked owing of the heart which follows occlu- on of the principal artery which supplies congenital arteriovenous aneurysm or ie communicating openings. Nocoladoni, n an article entitled "Phlebarteriectasie er rechten oberen Extremität," published n 1875, mentions very definitely the owing of the pulse which follows closure f the principal artery, branches of which ommunicate directly with the veins with- ut intervention of capillaries. This henomenon is also described by Israel in n article published in 1877, entitled Angiectasie in Stromgebiete der arteria ibialis antica." He states that digital clusion of the femoral artery caused the ulse to drop from 108 to 66 beats per minute, ith considerable increase in arterial pressure roximal to the point of occlusion. The heart's ction also became somewhat irregular. When the

FIG. 9.



X ray of injected specimen indicating the relation of the vessels found in the lesion represented in Fig. 8. This case suggests the relation which may exist between the different types of angioma and congenital arteriovenous aneurysm. Rich communication between arteries and veins is shown.

xtremity was raised, so that the amount of blood owing through the aneurysm was reduced, the pulse ropped from 92 to 54.

In both of these communications the bradycardiac reaction is definitely mentioned. Branham's description of this phenomenon was made in 1890. Nicoladoni's description preceded this by almost fifteen years. Various explanations have been given of this phenomenon. The reaction depends upon the amount of blood that is shunted through the aneurysm. If the communication is small the phenomenon will not be observed. If large or many, the phenomenon will be observed, and the congenital type of arteriovenous aneurysm does not differ in this respect from the traumatic. Lewis and Drury came to the following conclusions concerning this phenomenon in their study of the traumatic variety. Their conclusions are expressed as follows:

FIG. 10.

The history of this patient is given under Case 4. Dilatation of vessels on the back of the hand is marked. Some of the signs of an aneurysm persisted after operation. The patient was finally lost track of, so that final result cannot be given. This case is published through the kindness of Dr. Max Ballin, of Detroit.

> "Dealing with the phenomenon observed—namely, conspicuous fall in rate on closing the anastomosis. This fall is vagal in origin, for it is abolished by atropinisation. We are justified in concluding that it is wholly vagal, for at the height of the atropine reaction in the case tested the pulse-rate was altered by but two beats per minute on closing the anastomosis. This slight difference is sufficient to be explained by incomplate paralysis of the vagus by the drug."

Naun has recently made a similar observation. The rise of rate in opening the anastomosis is to be ascribed to a fall of vagal tone. But compression of the artery leading to the aneurysm was ascertained in two of our patients to produce no fall of venous pressure and decompression was ascertained to produce no rise of venous pressure. The changes of heart-rate on compressing and decompressing the artery cannot be ascribed therefore to altered venous filling, but must be attributed mainly to altered arterial pressure. With the last they are very closely associated. When the leak is closed, the lowest pulse-rate is reached within a few heart cycles of the

act of compression. It is at this phase that the systolic arterial pressures rise to their highest. The lowest heart-rate is not long maintained, neither is the highest arterial pressure, both are fleeting; but as this systolic pressure also rises a little or remains unchanged, the arterial pressure change may be viewed as a rise of mean pressure. That a rise of mean arterial pressure retards the heart-beat was first shown by Marey; the effect is generally acknowledged and is ascribed to the vagus.

Lewis and Drury, in summing up, state that:

"in arteriovenous aneurysm the pulse-rate is higher than normal, and this rapid heart action is due to changed vagal tone, controlled through the medium of mean arterial pressure. These observations provide us with a simple explanation of the increased heart-rate which is generally recognised to occur in aortic regurgitation; for the same factor, low mean arterial pressure comes into play in these cases also. When an arteriovenous aneurysm has become established the initial rapidity of the heart's action appears to be in a measure checked, for the rates on closing the leak are lower than normal; probably the same is true in aortic disease."

FIG. 11.

Arteriovenous aneurysm of left ear. Considerable improvement has followed extirpation of veins on the anterior surface of the ear. History given under Case 5. Reported through the courtesy of Dr. Charles Bagley, of Baltimore.

Cardiac Enlargement.

Cardiac enlargement was also noted in aneurysms of the congenital type by Nicoladoni and Israel. In Israel's case the patient was a child, 9 years of age. It is stated that following the amputation for gangrene, following operative interference on the femoral artery, the femoral arteries have become alike, that the right external iliac which was before the operation tortuous, cirsoid and much dilated, differs from the normal artery on the left side only by increased pressure, and that the dilated heart has becor smaller in all diameters.

It will be seen, therefore, that cardiac enlargeme may occur in the clinical picture of this type aneurysm. Cases have been reported by Nicolado Israel, Steinheil, Emanuel, Simmons, Perthes, Pusc and others. The objection might be raised that some of these cases the cardiac changes were seconda to high blood pressure, coronary sclerosis, or emph sema; but enough cases have been observed in whi the heart has returned to normal after the operatio to justify the conclusion that the cardiac chang are dependent upon a disturbed vascular mechanis Leriche extirpated a traumatic arteriovenous aneurys in a patient with enlargement of the heart and sig of decompensation. After the operation the hea returned to normal and the signs of decompensati disappeared. A similar case has been observed Hoover and Beans. The case observed by Israel h already been cited.

According to Lewis and Drury:—

"The cardiac change may be due to a diminished blo flow through the nutrient vessels of the heart. If we take t supply to our limbs as our index, then the flow through t coronary vessels may be diminished by an arteriovenc aneurysm to even one-half of its normal amount. Moreov Markewalder and Starling have brought evidence to sh that the flow in the coronary vessels is peculiarly depende upon aortic pressures; that being the case, the fall of me arterial pressure is of even greater consequence to t metabolism of the heart than it is to the metabolism of t body generally. A dilatation of the heart consecutive to t formation of a free arteriovenous anastomosis appears to u natural sequence."

The cardiac changes may be the direct result of t circulatory disturbances associated with the congenit arteriovenous aneurysm. In some there are cardiac changes. In these not enough blood shunted directly into the veins to produce the changes, the anastomosis or anastomoses bei relatively small. It has never been determined h much blood must be shunted directly into the vei to cause this change. Congenital arteriovenc aneurysms occur in the young, and the heart may able in these cases to take care of the increased wo thrown upon it. In none of the cases observed me has cardiac hypertrophy or decompensati been a marked feature of the clinical picture. Th statement also applies to the cases observed by Dan of congenital arteriovenous aneurysms of the cerebr vessels.

There is abundant evidence to prove that cardi hypertrophy and decompensation may follow traumat arteriovenous aneurysm. Cazanian noted that hypertrophied heart diminished in size followi successful operation. That dilatation is the ma element in the enlargement is clearly evidenced the rapidity with which the size decreases when i cause is removed; thus Naun and his collaborato noticed the change to occur within a few weeks the operation in two cases. Similar rapid return the heart to normal has been observed in a numb of cases.

Development of the Aneurysm.

In many of the cases reported the signs and sympton of an arteriovenous aneurysm were not present birth. In Cases 1 and 6 of the series no reported the signs of an aneurysm, according to t statement of the patient, did not appear until t patients were 13 and 41 years of age respectivel There is a possibility in all of the cases that the sig were present but not noted. In other cases t signs and symptoms have developed, according the patient's statement, after a strain or injury b

lunt force. In none of the cases, however, has nere been a penetrating wound; therefore, the ossibility of the traumatic variety of arteriovenous neurysm can be excluded.

Rienhoff states that:—

congenital arteriovenous fistula is a very rare condition, ut a definite clinical syndrome which has been confused in ne past with other congenital anomalies of the blood ascular system, such as aneurysm by anastomosis, cirsoid neurysm, nevus maternus, pulsating nevus and venous neurysm. In consideration of the mode of development of the lood vascular system, and in view of the fact that in one xperiment an arteriovenous fistula was observed in formation, 'e feel that congenital arteriovenous fistula occurs as the sult of the persistence of vessels or communications of ne primary anlage, which, failing to develop into the ormal definitive vascular tree, results in the formation of nastomotic channels either directly or indirectly between therwise normally developed arterial and venous trunks."

Apparently the abnormal communications may be stablished after birth, either spontaneously or as ne result of some injury in which the vessel walls ave not been penetrated. This statement is made fter eliciting a careful history of patients under bservation and studying cases which have been eported. If there is a direct end-to-end communica- on between the vessels, the lesion may resemble a umour in its rapid enlargement and destructive haracter. The enlargement will be considerably ss rapid when the arteries and veins are connected y small lateral communications. The communication etween the arteries and veins without the intervention f a capillary bed gives the distinct characteristics of sions of this type, and differentiates them from other ascular tumours clinically. Many of the vascular umours are potentially congenital arteriovenous neurysms, however, for at any time the direct ommunication between the arteries and veins may e established spontaneously, or as the result of n injury in which the skin is not penetrated.

Reid believes that cirsoid and arteriovenous neurysms are alike in many other respects. Ætio- gically, trauma and congenital anomalies are

FIG. 12.

welling beneath the heel indicates site of the lesion. This mass has a heaving pulsation, which is transmitted from some distance below. A systolic and diastolic thrill can be felt and a machinery-like murmur heard over the mass. No bradycardiac reaction can be elicited. There are no cardiac changes. Dilated veins may be seen in the skin. History given under Case 6.

roductive of both conditions. Trauma is by far ne most frequent cause of arteriovenous aneurysms; is probably the most frequent cause of cirsoid neurysms. Many of them have followed a blow on ne head, and most of the cirsoid aneurysms occur this region. In this very vascular region, where the bone is near the surface, blows might easily establish an anteriovenous communication, taking the form of a cirsoid aneurysm. Indeed many of the so-called congenital cirsoids of the head may have had their origin in the pressure exerted on the skull at birth. Clinically, both conditions lead to enormous dilatation and pulsation of the involved veins and proximal arteries. After a study of his own and reported cases, Reid says that he cannot escape the conclusion that there is no difference between cirsoid aneurysms and arteriovenous aneurysms, except that the term cirsoid aneurysm has been applied to that condition which results from abnormal venous communications which occur in the more peripheral and smaller vessels.

FIG. 13.

Arteriovenous aneurysm of base of brain. Many large tortuous veins are seen (Dandy).

Granting that the above contentions are true, it must be assumed in most cases that there has been an anomaly in the blood vascular anlage which permits of the development of this peculiar lesion when the essential causative factors, such as blunt force or a spontaneous communication between the arteries and veins are operative. That a communication may be established relatively late between anomalous arteries and veins would seem to be well shown in arteriovenous aneurysms of the brain. In 44 per cent. of the cases in Dandy's report, the first symptom did not appear until after the age of 30, and in 30 per cent. the symptoms began after the fortieth year. The latest appearance was at the age of 48. If we may assume that the symptoms were associated with the aneurysmal changes in vessels in which an anomaly was present, the communication between the arteries and veins did not develop until late.

According to Dandy, two types of arteriovenous aneurysms occur in the brain. In one an anomalous vessel of congenital origin established a direct end-to-end communication between an artery and vein;

in the other a net-work of vessels—so-called angioma—is interposed between an artery and one or several veins. Both types are characterised by large, full and tortuous veins on the surface of the brain. (Fig. 13.) A thrill can usually be felt, and red arterial blood can be seen in the dark venous blood. Congenital anomalies are usually found in the veins on the surface of the brain. Arteriovenous aneurysms of the brain are not uncommon, occurring, according to Dandy, in about 1 per cent. of a series of brain tumours. It seems to me that this class of arteriovenous aneurysms indicates more clearly than any other that the anomaly in the vascular anlage, which later gives rise to the aneurysm, is congenital, and that the communication between the arteries and veins may be established later, and in the brain spontaneously. Such spontaneous communications also develop in the extremities.

(To be concluded.)

COG-WHEEL BREATHING.

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The following paragraph appears in a well-known handbook [1]:—

Jerky, Interrupted, or Cog-wheel Inspiration.—Here the sound is not continuous, but occurs in waves or sharp jerks. This indicates irregular expansion of the alveoli, due to unequal elasticity in various parts of the lobules, and is therefore not infrequently present in early tuberculosis. It may result, however, simply from nervousness, and to carry any weight as a physical sign it must be well marked even on deep inspiration. Even then, however, it may mean little or nothing, and should only take a very secondary place.

Again, according to Powell and Hartley,[2] cog-wheel breathing may be due to irregular action of the respiratory muscles, to hysteria, or to textural diseases of the lungs, or may be produced by cardiac pulsation; and in their table of physical signs [3] its significance is given as "irregular expansion of lung from partial consolidation around small bronchi; but often of purely nervous origin through irregular contraction of muscles." American authors [4 5] express similar views. In other words, the general opinion seems to be that cog-wheel breathing has sometimes a pathological, sometimes a functional, and sometimes a physiological origin; that at times it indicates early tuberculosis, and at others has little or no significance.

Study of 1000 Cases.

In order to attempt to clarify the position and to assess the value of cog-wheel breathing as a physical sign, a study of 1000 cases was undertaken, consisting of 428 adult males, 409 adult females, and 163 children under 16. In 292 of these pulmonary tuberculosis was diagnosed, while in the large majority of the remaining 708 no lung lesion was apparent.

The inquiry emphasised the fact that cog-wheel breathing, as defined above, is of two kinds. In one the interruptions are irregular; in the other they are regular or, to be more exact, they are synchronised with the beat of the heart. Breathing of the first type is uncommon, and is rarely, if ever, heard a well-marked waves or sharp jerks. In none of th 1000 cases could it be ascribed to a pulmonary o pleural lesion, and, on the few occasions on which i was heard, it was noticeable only when the patien was breathing forcibly. The writer holds that fo testing the quality of breath sounds forcible respira tion should not be used, and, if this rule is adhered to irregularly interrupted breathing is so rarely hear that it ceases to be of any importance for clinica purposes. Breathing of the second type, on th other hand, is by no means uncommon and can a times be a very striking feature. The description an figures given below refer only to this second, o regular, type, which would appear to be merely physiological phenomenon, and for which "air waves" is the most suitable term.

DESCRIPTION OF AIR-WAVES.

Air-waves are heard during inspiration, but onl rarely during expiration. Though synchronised wit the beat of the heart, and systolic in time, they ar breath sounds not heart sounds, for they cease whe the breath is held (or during expiration) and th heart sounds may then be audible in their place Their number during an inspiration varies with th pulse- and respiration-rates, but usually at least tw or three waves can be heard. Their intensity varie in different patients from a series of sharp hissin sounds with short intervening pauses to barel perceptible rhythmical increases in the inspirator sound, but is constant for any particular patient Certain factors, particularly the force of the cardia impulse, may affect their intensity but under simila conditions they remain the same from day to day They are heard best near the angle of the left scapul or in the axilla, and sometimes only over a sma area and after careful search. If present here the may in some cases be heard round the border of th heart in front, particularly just outside the apex, o over the greater part of the left lung, or sometime on the right side as well. They are less obviou during deep inspiration, but appear to be mor obvious in cases of fibrosis.

FREQUENCY.

In the 1000 cases investigated, air-waves were no considered to be present unless at least at one plac their cardiac timing could be recognised. Under th ordinary conditions of examination, and without an attempt to reinforce them, they were found in 12 (30 per cent.) of the adult males, in 217 (53 per cent of the adult females, and in 31 (19 per cent.) of th children under 16. In each successive 100 case examined there was rarely more than a 10 per cent difference from these figures.

RELATION TO TUBERCULOSIS.

The following table shows that the percentages o cases with air-waves were decidedly higher in th tuberculous than in the non-tuberculous:—

—	Non-tuberculous cases.			Tuberculous cases.		
	A.m.	A.f.	C.	A.m.	A.f.	C.
With air-waves ..	69	123	27	58	92	4
Without air-waves	211	150	128	90	136	4
Percentage with air-waves	25	46	17	39	68	50

A.m. = Adult males. A.f. = Adult females. C. = Children.

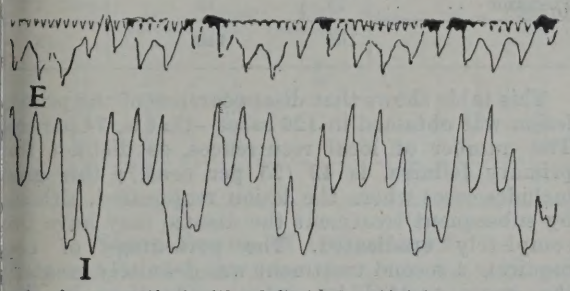
The difference is probably of no significance, for th

[1] Hutchison, R., and Hunter, D.: Clinical Methods, London, 1929, p. 302.
[2] Powell, R. D., and Hartley, P. H.-S.: Diseases of the Lungs, 6th edition, London, 1921, p. 52.
[3] Ibid., p. 40.
[4] Fishberg, M.: Pulmonary Tuberculosis, Philadelphia, 1922, p. 341.
[5] Norris, G. W., and Landis, H. R. M.: Diseases of the Chest, 4th edition, Philadelphia, 1929, p. 129.

tuation of the air-waves bore no relation to the site r character of the lesion, and probably is to be ccounted for by a generally more forcible cardiac ction in the tuberculous. The same factor, but aused in this case by nervousness, no doubt accounts or a percentage of air-waves of 64 in non-tuberculous omen between the ages of 16 and 25, as compared ith that of 37 for non-tuberculous women over 25.

CAUSE.

The situation and the timing of air-waves make probable that the heart, and particularly the left entricle, is intimately concerned in their production. would suggest that the contraction of the heart auses a compensatory expansion of the adjacent art of the lung so that it expands in a series of rks, with a corresponding effect on the inspiratory rrent of air and the breath sounds. Before such a eory can be accepted, it must be proved (1) that an crease of the intrathoracic negative pressure occurs ith each cardiac systole, (2) that the current of air ltering the lungs undergoes periodic acceleration,



acing from a patient with a left-sided artificial pneumothorax. The upper record is from the cardiac impulse on the chest wall, the lower from the pneumothorax. In the latter, expiration is marked E and inspiration I. The highest expiratory and lowest inspiratory pressures were 13 and 5 cm. of water, respectively. The tracing, to be read from left to right, shows negative pressure waves in the pneumothorax during inspiration and expiration, synchronous with the beat of the heart.

) that forcible action of the heart increases air-aves, and (4) that expiration is affected similarly to spiration.

1. An investigation of changes of pressure in the thorax as made in a series of patients undergoing artificial pneumo-orax treatment. Using the metal manometer of the eaf's apparatus, which is more sensitive than the water anometer of the Lillingston and Pearson model, it was und that in all cases a reduction of pressure occurred in e pneumothorax with each cardiac systole. These reduc-ons were approximately the same during expiration and spiration, they were slight in the right-sided cases, they ere larger when the collapse of the lung was complete and hen the mediastinum was rigid, and they amounted to a gative pressure of 3 or 4 cm. of water in some left-sided ses in which well-marked air-waves had been heard fore the pneumothorax was induced. Some records were ade with a polygraph.

2. Pressure fluctuations, which presumably would result alterations of velocity, were demonstrated in the inspira-ry and expiratory currents of air by attaching the mano-eter to a lead from the tubing of a Douglas mask; and replacing the manometer by a polygraph, the synchronisa-on of the respiratory waves with the apex thrust was own. In many cases waves can be heard in the trachea the patient takes a long slow breath.

3. In several patients the effect of exercise on air-waves as tested. It invariably increased their audibility or, in me cases, rendered them audible when they could not be ard under normal conditions. A few cases of valvular sease of the heart with hypertrophy were examined, but increased tendency to air-waves was noted.

4. The tests just mentioned in paragraphs (1) and (2) show at pressure fluctuations occur in expiration as well as in spiration, though air-waves are not often heard in the rmer.

Finally, the question arises: If air-waves are a ysiological phenomenon, why cannot they be heard in every individual? The investigation showed that air-waves differ in intensity in different cases. In some they are well marked, in others barely recognisable, and in others inaudible even after exercise. Yet pressure fluctuations were recognisable in the pneumothorax of all of the cases tested and it is reasonable to suppose that air-waves, inspiratory and expiratory, could be heard in all individuals if the auscultatory test were sufficiently sensitive.

DIFFERENTIAL DIAGNOSIS.

Certain sounds with a cardio-respiratory timing can occasionally be heard, the commonest of which are exocardial murmurs, pleuro-pericardial friction, and certain vascular murmurs. Hutchison and Hunter [6] describe an exocardial murmur as follows:—

> A soft systolic murmur of exocardiac origin is occasionally audible near the apex of the heart in cases of pulmonary tuberculosis; it is often propagated towards the axilla just as a mitral systolic murmur would be, but may be distinguished by its ceasing to be heard over the heart itself where uncovered by lung, and by disappearing or altering markedly in character when the patient holds his breath. Such cardio-respiratory murmurs must not be mistaken for the true endocardial ones.

The possible explanation of such murmurs on the basis of air-waves should always be borne in mind. At least four of the 1000 cases investigated had been diagnosed as cases of heart disease on account of a systolic murmur heard to the left of the apex of the heart during inspiration. As none of the four had symptoms of heart disease and all had well-marked air-waves over the left lower lobe posteriorly, it is almost certain that the so-called murmur was also a respiratory sound. Similarly, some cases of so-called pleuro-pericardial friction are merely instances of air-waves, and are respiratory sounds not friction sounds. In two of the 1000 cases a definite pleural friction sound at a distance from the heart had a cardiac timing during inspiration, while air-waves could be heard over adjacent parts of the chest wall. On the other hand, murmurs may be heard during inspiration over the upper part of the chest in front which are certainly not air-waves. The commonest is that heard just below part of the clavicle on either side. It is a vascular murmur from the subclavian artery, heard towards the end of inspiration when the vessel has descended with the apex of the lung and has come within the range of the stethoscope.

Conclusions.

1. Cog-wheel breathing is of two kinds. In one the interruptions are irregular, and are due probably to irregular action of the respiratory muscles. In the other they are regular, have a cardiac timing, and are best termed air-waves.

2. Air-waves were found in 30 per cent. of adult males, in 53 per cent. of adult females, and in 19 per cent. of children under 16 in 1000 cases investigated.

3. Air-waves are not caused by tuberculosis of the underlying lung tissue, but are a physiological phenomenon.

4. Their situation and the demonstration of pressure fluctuations, synchronous with cardiac systole, in the pneumothorax cavity of some patients and in the inspiratory and expiratory currents of air of others, suggest that they are caused by an expansion of the lung compensatory to the contraction of the heart.

5. Certain cases of so-called exocardial murmurs and of pleuro-pericardial friction are probably merely instances of air-waves.

[6] Op. cit., p. 177.

RADIUM TREATMENT OF CANCER OF THE TONGUE.*

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Radium treatment of cancer of the tongue has made rapid strides in the past few years, following the results obtained by Regaud, who introduced the method of needling now in most general use. A period of exaggerated enthusiasm followed, and, unless a period of unjustifiable pessimism is to come, it is essential from time to time to review the position of this relatively new method.

Selection of Cases.

The time for comparing and contrasting radium with surgery has passed, so far as the immediate results are concerned, and the possibilities of radium are now universally recognised; but a comparison of end-results is more difficult to assess accurately because operability is of far greater importance in excisional treatment than it is in radiotherapy. Radium as a method of treatment is applicable in cases totally unsuitable for excision and, in the study of the list of cases to follow, no attempt is made to separate the operable from the inoperable group; stress is, however, laid upon the glandular condition. All cases were treated with the exception of those actually not expected to survive more than a few weeks. The chief object in view was to alleviate the patient's condition, even if nothing more than palliation was anticipated. The selection of cases makes a vast difference in the percentage of final results, but we were less concerned with the brilliancy of eventual statistical tables than with the attempt to treat all cancerous patients seeking advice; and in this way from time to time an entirely unexpected result was obtained, which was nothing short of a miracle. This was perhaps a factor mercifully provided by chance in an otherwise dismal procession of patients, the majority of whom were rejects from other institutions and were well beyond the range of even the most courageous of surgeons.

All the cases were treated by implantation of radium needles into and around the tumour, seeds being used exceptionally when local conditions demanded it. The needles used contained 0·6 mg. and 1·3 mg. of radium, and were fully screened by 0·5 mm. and 0·6 mm. of platinum respectively. The period of treatment was seven days. The amount of radium used depended upon the extent of the disease. Treatment of the primary lesion was nearly always followed by treatment of the lymphatic area in the neck. Only in the first two years was this occasionally omitted, generally in cases where nothing abnormal was palpable. This policy proved disastrous and was soon abandoned in favour of systematic treatment of the lymphatic areas in all cases.

Analysis of Results.

The statistical tables submitted are based upon a total of all my own cases treated at Westminster Hospital, in private and elsewhere, and upon the cases treated by my colleagues at Westminster Hospital. They cover the period of five years from April, 1925, to April, 1930. There is no selection of cases; the few not submitted to treatment are not included in the tables. Those that could not be traced are considered as having died three months after their last visit to the hospital. The remainder of the cases have been traced and seen, or the doctors communicated with. A suspicious induration is considered as a local recurrence, unless excised and proved to be non-malignant on histological section.

Oral Cancer.—The total number of cases of oral cancer treated is 253; distributed as shown in Table I.

Table I.—*Total Cases of Oral Cancer.*

Tongue	169	Palate	8
Cheek (buccal mucosa) ..	23	Lip	1
Tonsil	12		

Lingual Cancer.—The total number of cases of lingual cancer is 169, distributed as in Table II.

Table II.—*April, 1925, to April, 1930: Five Years.*

Carcinoma of tongue.	Total.	Disappearance of primary growth.	Local recurrence
Anterior	20	15	7
Antero-lateral ..	79	65	21
Postero-lateral ..	14	9	2
Inferior	33	25	9
Posterior	23	12	4
	169	126	43

This table shows that disappearance of the primary lesion was obtained in 126 cases—that is, 74 per cent. The number of local recurrences, as distinct from primary failures, is 43 (25 per cent.); this group includes cases where the lesion reappeared, although by subsequent treatment the disease may have been completely eradicated. The percentage of cases requiring a second treatment was definitely greater in the group treated by radon seeds than in those treated by needles. In some cases local recurrence were obviously due to under-dosage and, as experience increased, this group of cases became smaller. The local recurrences must be carefully distinguished from ulceration at the site previously occupied by the primary growth which may be due to sepsis, excessive irradiation, and a delayed radium reaction, specially in areas involving the mucosa covering the gum, where an underlying necrosis of the bone may not become evident till a few months later. The percentage of local recurrences can be minimised by removing with the diathermy needle all suspicious indurations, residual nodules of thickened tissue although these may only be due to fibrosis. The local condition of the area previously occupied by the neoplasm must be soft, resilient, and covered with intact mucous membrane. With adequate screenage, suitable dosage, uniform distribution of the needles, strict aseptic precautions, and preliminary oral hygiene, including the removal of teeth, this can be achieved in the majority of cases.

Survival-rate.

Table III. shows the survival-rate in the cases treated in each year. It shows only two cases alive out of a total of 18 cases treated in 1925. But this list must be studied in conjunction with Table IV.

Table III.—*Survival-rate.*

Year.	Total cases.	Alive to-day and percentage.	Years of survival
1925	18	2 (11)	5
1926	16	3 (18·7)	4
1927	23	6 (26·5)	3
1928	33	16 (48·4)	2
1929	47	30 (63·8)	1
1930	32	16 (50)	Less than one.
Total..	169	73 (47·9)	—

* Read at the Section of Surgery of the British Medical Association's meeting at Winnipeg, Canada, reported on p. 638

which shows that of the 18 cases 13 had palpable glands, and in seven of these the glands were surgically removable; this leaves five cases with no palpable glands, of which two are alive at the end of five years. It has already been stated that in the early days the treatment of the neck received only scanty attention, so that, although these five cases were early, some of them had no treatment to the lymphatic area till it was too late and eventually died from metastasis.

Table IV. shows the number of cases treated in each year, those with lymphatic involvement and those where the glands were inoperable. The percentage of survival for less than one year in 1930 is 50 per cent.—that is, less than the one-year survival for 1929, and can be explained by a marked increase in hopeless cases treated as more accommodation for patients was provided.

TABLE IV.—*Glandular Involvement and Rate of Survival.*

Year.	Total cases.	Glands		Survival in years.			
		Involved.	Inoperable.	Five and four.	Three.	Two.	One or less.
1925	18	13	7	2	3	1	2
1926	16	14	9	3	4	2	7
1927	23	22	11	—	6	5	12
1928	33	24	15	—	—	16	17
1929	47	33	23	—	—	—	30
1930	32	24	18	—	—	—	16
Total	169	130	83	5	13	24	84

Some Points of Importance.

The experience gained by the treatment and the study of after-results of these 253 cases has led to a better understanding of the disease, to some improvements in the methods of treatment, and to a more thorough attack on the glandular area. The lessons learned are summarised below.

TREATMENT OF PRIMARY LESION.

(*a*) Needles are preferred to seeds as more accurate distribution is possible and there is less likelihood of leaving non-irradiated areas and so possible sites for future recurrences.

(*b*) The impression that results are more permanent with radium salt than with emanation is based upon actual cases, and is possibly due to the uniform intensity being maintained through the whole period of treatment with the former.

(*c*) Screenage by 0·6 mm. of platinum is preferred, as this allows the treatment to be continued for seven to ten days without marked risk of necrosis.

(*d*) Re-needling of the tongue at the end of the first week is practised in extensive lesions and is referred to larger dosage left in for seven days only.

(*e*) Cases of posterior carcinoma can be needled by open operation through a pharyngotomy with great accuracy and good result. Peroral needling is less accurate and should be reserved for the more insensitive type of tumour (the transitional-celled carcinoma of Quick or lymphocarcinoma of Regaud).

PROSTHETIC APPLIANCES.

(*a*) Lead protection of the roof of the mouth is practised in every case where the amount of radium in the tongue exceeds 6 mg. (10 needles of 0·6 mg. or its equivalent). The protection is not always necessary, but is a safeguard against radium burns of the palate which have occurred in non-protected cases.

(*b*) Lead protection of the floor of the mouth is not used as a routine, but only in cases where the disease is entirely localised to the tongue and does not involve the floor of the mouth.

(*c*) Plates made of stent or vulcanite or composition are used to help to retain the needles in the floor of the mouth. These plates do not contain lead.

(*d*) Surface application to the tongue is not practised. In cases too advanced for needling, seeds are used and glossectomy by the diathermy is considered.

Treatment of the Cervical Area.

No neck should be left untreated, even if no glands are palpable, and the lesion in the tongue is small, the gravity of possible extension to glands is such that treatment cannot be omitted. In certain histological types and in patients under 50 years of age the prognosis entirely depends upon the early and vigorous treatment of the neck. The policy at present advocated is to divide the cases into three groups—namely: (1) unpalpable glands, (2) palpable glands, and (3) inoperable glands. The treatment differs in each group.

UNPALPABLE GLANDS.

This group is suitable for needling of the neck by the "closed method." The distribution of the needles must be accurate, extending from the mastoid process to the clavicle and providing efficient irradiation in the submental, submaxillary, anterior, and posterior triangles of the neck. With a little experience the needles can be placed in position without an operation for access. As an alternative to this method a radium collar can be employed, but as the treatment is entirely a prophylactic measure, a two-stage irradiation is not indicated. Needling is, as a rule, preferred by the patient, as it is somewhat less irksome than surface application.

PALPABLE GLANDS.

When the glands are palpable but small, mobile and absolutely operable, the choice of treatment lies between operative removal and "open needling" after providing access to the glandular area by surgical means. Surgical removal of the glands is only indicated if the following conditions obtain:—

(1) The primary lesion must have entirely disappeared.
(2) The glands must be absolutely operable.
(3) The general health of the patient must be good.

If the operation for the removal of the glands is undertaken, it must be a complete and wide excision. Half measures have no place in the treatment of the cancerous neck; an incomplete operation leaves the patient in a worse plight than before the treatment and must never be done, as irradiation offers so much more. The operation is variously known as Butlin's, Crile's, or "block" dissection, and is sufficiently well known not to require a description here.

The insertion of radium in the neck at the end of the operation is not advisable, and irradiation is much more efficiently carried out as a second stage by means of a columbia paste collar after the wound is healed.

If the surgical removal of glands is not undertaken the neck is needled by the "open method." Insertion of needles blindly into the neck in cases where the glands are palpable, but early and discrete, is not advisable; more freedom and, hence, greater accuracy is obtained by incising the neck along the sterno-mastoid, exposing both its anterior and posterior borders, dividing the common facial vein at a short distance from the internal jugular, and placing the needles in position under vision in close proximity to the enlarged glands; the submaxillary and submental areas are also needled.

INOPERABLE GLANDS.

When the glands are matted together and a fixed mass is present in the neck, palliation only is aimed at.

It is obtained by needling the mass and the surrounding tissues with a relatively large quantity of radium; the technique of needling in this case differs from that in the group dealing with palpable glands. The mass is literally filled with radium; seeds can be used here, and screenage is of lesser importance as the mass of tissue itself acts as a protection. It gives remarkal results at times. The interstitial method is follow two or three weeks later by surface application the whole neck. The future will show if distan applications with the "bomb" will give better resu than the methods here described.

CLINICAL AND LABORATORY NOTES

RAYNAUD'S DISEASE,

WITH PAROXYSMAL HÆMOGLOBINURIA.

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Six months ago a child, aged 3 years, was taken ill after being aroused from sleep suddenly in the middle of the night and very much frightened by the intrusion of a drunken man into the house.

He had previously been in good health as far as the parents were able to judge, his only illness having been measles in infancy. He had been fed on Cow and Gate food. The mother had had one previous miscarriage and had subsequently had one other child, who appeared to be in good health. The father, who had never been a patient of mine, was said to suffer from bronchial catarrh in the winter time. He had seen military service. His blood was later examined and found to be Wassermann positive. The aunt, on the mother's side, who brought this case to my notice, had been under treatment by me for functional neurosis of an anxiety type for a period of six months.

NATURE OF ATTACKS.

Immediately after the alarming incident the child was noticed to have an attack of pain and coldness of his hands, feet, and ears. Several attacks had since occurred, the description of a typical one being as follows: When out in the cold the child would become suddenly doubled up with pain, and would cry and have to be taken home at once. The fingers, especially the index-finger of one hand, the toes, and sometimes the whole foot and the pinna of both ears would become black and swollen. On arrival home after such an attack the first specimen of urine passed would be dark coloured, but the colour of the next specimen would be normal. The child would fall asleep and was frequently quite well on awakening, although very nervous and frightened. Such attacks had occurred fortnightly for the past few months, and had increased in severity.

On March 21st, 1930, when I first examined the child, I found him lying on a couch looking very apathetic and atonic. He was pale, but the mucous membranes were not especially anæmic. The legs were wasted and weak, and he could not support his weight for long. There were frontal and parietal bosses, beaded ribs, and well-marked thickenings at the ends of the long bones. The tongue was slightly furred, tonsils slightly enlarged, and teeth very fine and small; no gingivitis was present. There was nothing abnormal in the heart and lungs. The abdomen was somewhat protuberant, and the liver was palpable, but the spleen was not. Reflexes were present and equal, though somewhat exaggerated. No objective changes in sensation could be made out. The optic discs were normal. There was slight œdema on the dorsum of the left foot. A specimen of urine was requested; a day or two later this arrived and was found to be port-wine coloured.

I examined the child at his home on March 24th. On this occasion he looked better than at my previous visit, and indeed got up and began to play with his toys, conversing quite happily with his parents for a few minutes. There was a violet discoloration of the pinna of both ears, and dark coloration of the index-finger of one hand; the feet were normal. The temperature was normal at both visits.

EXAMINATION OF URINE.

The urine was found to contain albumin and to give the guaiacum test for blood. It contained no red cells or casts. The deposit consisted mainly of indefinite brown masses which, when examined with a higher power, were seen to contain masses of pigment. On standing a little, numerous crystals of the coffin-lid variety were deposited (ammonio-magnesium phosphate). I took a specimen to the city laboratory, where Dr. Storer was kind enough to examine it, and he confirmed the absence of casts and red cells. He also demonstrated with the spectroscope the absorption bar characteristic of normal blood.

I was privileged to see a further attack which occurr on April 8th. The fingers and toes were blackish a swollen. There was œdema of the dorsum of both han and feet and the ears were cyanosed. The child on t occasion passed port-wine coloured urine at mid-day (t attack occurred in the afternoon), and also after the atta I have seen the child in two slight attacks since then.

Treatment has been directed towards the maintenan of warmth at all times, the addition of such articles of diet were found to be deficient supplemented by preparatio containing vitamins. Inunctions of mercury have be started.

The case is interesting as illustrating the type Raynaud's disease occurring in children, where t process does not proceed to the stage of gangren The syncopal stage is extremely short and is barel noticeable, the asphyxial stage being the o observed. The profound neurotic history in t family, the influence of cold on all occasions, and t comparative rarity of the disease are interesting. appears to be common in these cases to find a relatio ship with parental syphilis.

RETROPERITONEAL FIBROMA

ARISING FROM THE ANTERIOR COMMON LIGAMENT

By W. H. Ogilvie, M.D., M.Ch. Oxf., F.R.C.S. En
ASSISTANT SURGEON, GUY'S HOSPITAL.

The only interest in the following case, and n only excuse for publishing it after a lapse of eig years, is the rarity of the condition. The presen in a woman of 55 of a large mass in the abdom quite fixed and of almost stony hardness, ma malignant disease the only reasonable diagnos On the other hand, there was no point in the histor symptoms, or preoperative findings to indicate t organ involved. Operation was undertaken pur for purposes of exploration.

A thin married woman, looking more than her age 55 years, came up to the surgical out-patient departm at Guy's Hospital complaining of a throbbing sensation the upper abdomen, which she had noticed for th months. This was the only thing of which she complain There had been no vomiting, loss of weight, or pain, nor h she noticed any lump. All her bodily functions were acti normally.

On examination a prominence was immediately visib occupying the left upper quadrant of the abdomen. T proved on palpation to be a hard solid mass, roughly o in shape, firmly fixed to the posterior abdominal wall. reached inwards to the mid-line, and downwards two inc below the umbilicus, while above it appeared to pass un the costal margin. It formed no prominence in the loin. did not move on respiration, nor could it be moved passive On percussion the splenic dullness appeared to be continu into that of the lump; over the most prominent part th was a band of resonance. The urine was normal. T fæces gave a weak guaiac reaction, but no blood spectru The Wassermann reaction was strongly positive. An X r showed the stomach displaced downwards and outwar by a large mass in the region of the lesser omentum, suggesti a pancreatic cyst.

Laparotomy was performed on May 25th, 1922, throu a left paramedian incision. The stomach, splenic flexu

ıd descending colon were seen to be carried forward on a rge retroperitoneal mass, over the summit of which ran ıe inferior mesenteric vein. The left kidney could be felt ehind the upper pole of the swelling. An incision was made ıtside the descending colon, and the peritoneum and vessels ere displaced inwards as far as the aorta. A smooth, val tumour, 2½ by 4 inches, was thus exposed, surrounded y a distinct capsule and firmly attached to the bodies of ıe second and third lumbar vertebræ. Three of the lumbar teries entered the mass and the aorta was pushed slightly the right. The lumbar arteries were ligatured at their igin and the tumour was separated by the knife from the ıterior common ligament from which it appeared to spring, ıd shelled fairly easily from its capsule. The wound was wn up, a drain being left in the extraperitoneal tissues r 48 hours.

Microscopic section showed the tumour to be a broma with much necrosis. Recovery was uneventful, the patient leaving the hospital perfectly well.

I am indebted to Mr. R. P. Rowlands, whose registrar was at the time, for permission to publish this case.

INEFFECTIVE SWABBING IN DIPHTHERIA EPIDEMICS.

By Guy Bousfield, M.D. Lond.,
DIRECTOR OF THE CAMBERWELL RESEARCH LABORATORIES.

Extensive active immunisation is widely regarded the only effective method of controlling diphtheria. ith this view I have much sympathy, yet the fact ust be faced that even at the present time, in spite many years' experience and contrary teaching, any practitioners still rely on the result of a throat ab examination for the establishment of a diagnosis the commencement of antidiphtheritic treatment. ee The Lancet, Sept. 13th, p. 587.)

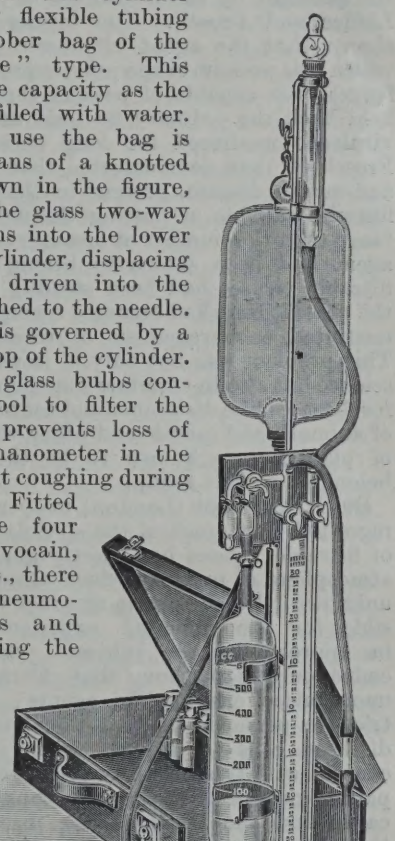
I find that the majority of medical officers who tack an epidemic by means of swabs submit material ken only from the throat. At the most, only a rinkling of nasal swabs, taken from children who ve obvious nasal discharge, is included. I submit at this practice makes the search for carriers actically futile. In examination of many thousands specimens taken during epidemics of diphtheria have identified polar-staining morphological diphria bacilli relatively about ten times as often in sal swabs as in throat swabs. The same may be id of swabs taken from children who must be rtified as free from diphtheria infection before they n be admitted to a convalescent home or other stitution. It is frankly admitted that quite a large oportion of morphological diphtheria bacilli isolated om nasal swabs proves to be non-virulent on animal st; yet exactly the same is true of bacilli found the throats of persons who show no throat lesion. Anatomically the nose tends to empty its secretions rectly to the exterior more than does the throat. uring play and in the absence (or even presence) the pocket handkerchief numerous opportunities r the spread of infection must occur. It is my firm lief that virulent diphtheria bacilli are disseminated ore commonly from nasal than from pharyngeal urces, in many cases by carriers who show no vious symptoms or lesion of nasal diphtheria.

A point of extreme importance is that positive nasal ltures (which may be virulent) are often obtained sily from persons whose throat cultures are contently negative. This fact does not seem to be nerally known. When a search is being made for rriers it is not enough to swab throats alone, and sal swabs which have been inserted into *both* nostrils ould also be submitted from each subject. In addition, any ear discharges must be similarly investigated. If expense does not exclude animal virulence tests, these should be undertaken in each case. When they cannot be done, the only safe procedure is to isolate all positive cases from the main community, whether the source of the bacilli was nasal or pharyngeal, until such time as local treatment has produced a series of negative swabs.

NEW INVENTIONS

ARTIFICIAL PNEUMOTHORAX APPARATUS.

This is a modification of the apparatus described by me nine years ago (The Lancet, 1921, ii., 710). In my former model the air reservoir consisted of a collapsible indiarubber bag. This has now been replaced by a glass cylinder graduated up to 600 c.cm. The lower end of this cylinder communicates by flexible tubing with a stout rubber bag of the "hot-water bottle" type. This bag is of the same capacity as the cylinder, and is filled with water. When ready for use the bag is suspended by means of a knotted silk cord, as shown in the figure, and on turning the glass two-way tap the water runs into the lower end of the glass cylinder, displacing the air, which is driven into the flexible tube attached to the needle. The rate of flow is governed by a screw clip at the top of the cylinder. There are three glass bulbs containing sterile wool to filter the air, and a trap prevents loss of water from the manometer in the event of the patient coughing during the operation. Fitted in the case are four bottles for novocain, iodine solution, &c., there is also room for pneumothorax needles and syringe for injecting the local anæsthetic. The manometer registers intrapleural pressure or pressure at which gas is being injected according to the position of the two-way tap. The apparatus can be used for both injection and withdrawal of measured quantities of gas, and its advantages are that it is easy to handle, it is light and compact, and it can be carried in any position.



The weight of the apparatus, which is made by Messrs. Down Bros., is 7¾ lb. and the outside measurements of the case are 19¼ × 9 × 4½ in.

Geoffrey Marshall, O.B.E., M.D., F.R.C.P.,
Officer i/c Tuberculosis Department, and Assistant Physician, Guy's Hospital.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN WINNIPEG.

(*Continued from p. 607.*)

SECTION OF MEDICINE.

Lord DAWSON presided over the first meeting of this Section and contributed a clinical introduction to a discussion on

Filtrable Viruses and Practical Medicine.

The importance of the subject was obvious, he said, when one recalled that such diseases as measles, mumps, small-pox, encephalitis, and the common cold of temperate climates, and yellow fever, dengue, and sandfly fever of the tropics, were caused by viruses belonging to the filtrable group. The technique given us by Pasteur and Koch, despite developments and improvements, had failed to reveal the ætiological secrets of these diseases, and light was first thrown on the problem by the researches of Ivanowsky and of Löffler and Frosch. The former investigator had shown that the agent of mosaic disease of plants, which was present in the juice expressed from affected leaves, was capable of passing through filters which held back the ordinary bacteria and of retaining its virulence unaltered for long periods. Löffler and Frosch in 1898 demonstrated that the virus of foot-and-mouth disease, present in the vesicle fluid, was likewise capable of passing through bacterial filters. Since then the number of diseases in which the causal agent had been shown to belong to this group of filtrable viruses had been steadily increasing, and at the present time had assumed a magnitude warranting unstinted encouragement of research in this field. This problem was not only of importance to medical science but also to veterinary medicine and agriculture, for diseases like distemper and foot-and-mouth disease of animals, and mosaic and other widespread diseases of plants, were known to be the work of agents belonging to this group.

Dr. S. P. BEDSON (London), in opening the discussion, regretted that much of the speculation on the nature of filtrable viruses had merely gone to heighten the atmosphere of mystery which always surrounded the unknown. In his opinion this fact was largely responsible for the difficulty experienced by clinicians in approaching the subject. Some workers had endeavoured to show that filtrable viruses were unorganised enzyme-like agents; others even had tried to persuade us that they were the product of diseased cells—a product which when brought in contact with fresh healthy cells gave rise to the same pathological process, the virus thus becoming both the cause and the result of the disease. Dr. Bedson thought it would have been more reasonable to approach the question from the standpoint that filtrable viruses were probably akin to bacteria. Adopting such a working hypothesis, the first question to solve was whether these viruses were living. Life was characterised by the ability to multiply, to adapt to alterations in environment, and to assimilate without loss of identity; and since viruses possessed these characters one was entitled to conclude that they were living. One factor more than any other had gone to obscure the relationship of filtrable viruses to the ordinary bacteria, and that was the limitation of visibility with the microscope. Undoubtedly, filtrable viruses were small, some of them truly inframicroscopic, but there was evidence that others —such as the viruses of small-pox, fowl-pox, and psittacosis—could be seen with the microscope. And since there were visible and cultivable bacteria which at the same time were filtrable, it seemed there was good reason for separating filtrable viruses from the ordinary bacteria on the score of size. The difficulty experienced in cultivating filtrable viruses was another reason advanced for their being unlike bacteria. It had been found impossible to grow them apart from living cells, but recent work by Muckenfuss and Rivers suggested that the cells only supplied some diffusible substance necessary for the growth of the virus, so that cultivation in a lifeless medium might eventually be achieved. The more that one learned about filtrable viruses the greater did the resemblance to bacteria become, so much so that the speaker looked forward to the merging of filtrable viruses and bacteria in one large group, inside which, of course, there would be sub-grouping just as there was in the case of bacteria at the present time.

IMMUNITY TO FILTRABLE VIRUSES.

There was a similar tendency, said Dr. Bedson, to differentiate between the immunity produced by filtrable viruses and bacteria. It had become the habit to speak of immunity to filtrable viruses as being solid and lifelong, in contrast to the immunity incited by bacteria which was often weak and fugitive. But such a generalisation was only partially true, for there were virus diseases such as foot-and-mouth disease, herpes, and the common cold, one attack of which conferred little or no immunity, and bacterial diseases like typhoid fever which gave rise to a solid one. Here again, it was impossible to draw a clear dividing line. With filtrable viruses as with bacteria it was possible to produce an active immunity which was associated with the development of specific antibodies, and with these antibodies it was possible to procure a passive immunity and demonstrate those in-vitro immunity reactions which were of such service in the case of bacterial diseases. Active prophylactic immunisation had been practised for some time in the case of small-pox and rabies. In the former disease use was made of the fact that the virus of small-pox, when adapted to the cow, lost its invasive power for human tissues and although this method was good in that it produced a satisfactory immunity, it was not without its dangers. Although opinion varied about the ætiology of post-vaccinal encephalitis there was little doubt that the invasion of the body by the vaccinia virus was directly or indirectly responsible. This had led to the advocacy by the Ministry of Health in England of vaccination by one insertion with minimum trauma and, with a similar object in view, dilution of the lymph had been practised at the London Hospital and in Germany. In the case of rabies attenuated virus was used for immunisation, and it was long thought that this method was not applicable to other filtrable viruses. But recent work by Vallée and his colleagues and the British Foot-and-Mouth Committee had shown that the foot-and-mouth virus still retained its antigenic properties when rendered inactive by means of low concentrations of formalin. The same thing had since been found true for the viruses of distemper, fowl-plague, and yellow fever; and that distemper prophylactic vaccination had been practised in the field with success.

PASSIVE IMMUNITY AND DIAGNOSTIC REACTIONS.

The use of convalescent serum in poliomyelitis was well known in Canada, but perhaps the efficacy of serum in the prophylaxis of measles was not so generally realised. Measles convalescent serum given in suitable doses within the first five days after exposure to infection resulted, as a rule, in complete protection, and given later from the fifth to eighth day modified the attack. The use of serum was

greatest service both in private practice and in itutions and hospitals. Dr. Bedson referred to the k of Gordon, Netter and Urbain, Ciuca and others, wing that both specific flocculation and comple- nt fixation could be demonstrated with filtrable ises and their antisera, and he cited the work of gess, Craigie, and Tulloch, showing the value of flocculation test as an aid to the diagnosis of ll-pox. He mentioned the work done by himself Dr. J. O. W. Bland in connexion with the plement-fixation reaction and cited examples of practical application. In conclusion, he said that ugh some of the problems in this field of research ned almost insuperable, the progress already made uld encourage perseverance. Those who came ore Pasteur must have been faced by problems no difficult.

DISCUSSION.

Dr. N. E. McKINNON (Toronto) confined his remarks he contributions which Canada had made to this stion of filtrable viruses. He spoke of the excellent k done in Winnipeg in connexion with the use of valescent serum in poliomyelitis. During the nt epidemic 66 cases received serum; only 4 hese developed residual paralysis and none died, reas of 54 cases not receiving serum, 34 developed dual paralyses and 6 died. The dosage used was c.cm. intramuscularly. Although the efficacy of sles convalescent serum was known in Canada it not used as extensively as it should be. Between years 1921–29 there were 5000 deaths from sles in Canada; this considerable mortality could oubtedly be materially reduced by the more nsive use of convalescent serum. He referred to apparent freedom from post-vaccinal encephalitis Canada and said that he was inclined to attribute to the method of vaccinating. In Canada the tice was to vaccinate either by a single scratch th in. long or by single puncture; the former hod was preferable, for it gave a higher per- age of takes. In conclusion, he referred to a ll outbreak of psittacosis which had been oughly investigated from the clinical and emiological standpoint.

Dr. D. N. NABARRO (London) spoke of the serum phylaxis of measles. He mentioned the various which had been advocated—Degkwitz's serum, the m prepared against the green streptococcus of nicliff, and human convalescent serum, and said of the three the last was the only satisfactory He gave the results of the use of convalescent m at the Hospital for Sick Children, Great Ormond- et. Serum from adult convalescents alone was loyed, and before being used this was submitted ltration and stringent tests for sterility. Out of 586 cases which had received serum only 21 were protected, and the majority of these developed a ified measles. He considered that the use of valescent serum was of the greatest service in pital practice.

Prof. A. W. M. ELLIS (London) said that the tion of filtrable viruses could be approached from riety of points of view. One thing which struck most forcibly was the evidence pointing to the percentage of carriers of filtrable viruses. He nced herpes in man, certain diseases of plants—of potato in particular—and possibly the encephalo- litis complicating vaccination and many of the ific fevers. The ancients had been wont to speak isease coming from within, but advance in our vledge of the causation of disease had reversed ers, and disease was usually spoken of now as ing from without. The evidence which the study of filtrable virus-diseases was bringing to light required an alteration in our conception of disease.

Dr. BEDSON, in reply, said that he was in entire agreement with all that Dr. McKinnon and Dr. Nabarro had said. He considered that the point raised by Prof. Ellis was a most important and interesting one. Virus carriers did undoubtedly exist, and the evidence available suggested that the balance established between host and virus could be upset by a variety of factors with the result that disease ensued.

Functional Disorders of Colon.

Dr. EDMUND SPRIGGS (Ruthin), in introducing at the second session a discussion on this subject, said that there was no organ about which there had been more difference of opinion. Abandoned by Metchnikoff as a useless relic, stormed by surgeons who removed pieces, or, when most merciful, stitched it up, laved with many waters by physicians and dosed by the public, it had been, and was, a battlefield, the Flanders of medicine. It was, indeed, fortunate that the large bowel, though easily injured by wrong habits or treatment, had great power of recovery. For knowledge of the diseases of the colon the profession owed much to Sir William Hale-White, whose papers from 1888 on classified these disorders, with clinical descriptions that have not been surpassed. In 4000 cases under Dr. Spriggs's care a note concerning the colon was made in 2086 by Dr. Mary Watson. In many the only mention was of delay. In 1543 some other major or minor abnormality was noted from the symptoms, signs, motions, or X ray examinations. The distribution of the lesions or disorders was as follows: obstruction, 19; parasites, 20; ulcerative colitis and colitis gravis, 29; dysenteries, 29; growths, 32; loops and redundancies, 45; colectomy, colostomy, and colopexy, 51; adhesions, largely post-operative, 85; mucous and mucomembranous colitis, 164; coloptosis, 202; diverticulosis and diverticulitis, 297; disorders of tone and segmentation, 570. The last group included 198 with excessive tone and spasm, and 84 cases of irritable colon with prominent clinical symptoms but little or no mucus.

The conditions classed by Dr. Spriggs as functional were colonic delay or constipation, irritable colon including nervous diarrhœa, spastic colon, mucous colitis or catarrh of the colon, and mucomembranous colitis. The word colitis, he remarked, is not strictly correct, but is used. In 141 consecutive cases of coloptosis, in 27 per cent. there was great delay, in 55 the rate of passage of the barium meal was normal, and in 35 others the delay was moderate only. Hence, in more than half, retardation was inconsiderable. It did not matter where the colon lay so long as it passed on its contents normally. Symptoms arose from dropping per se in severe cases only. Among the ætiological factors were mentioned infections, parasites, exposure and other injuries, and the two main causes—neurosis and constipation—were discussed. Dr. Spriggs suggested that the usual treatment for constipation—namely, irritating aperients—taken over long years was as potent and frequent a cause of colitic disorder as constipation itself. This was confirmed by the good result of withdrawal and by an analysis (by R. Picton-Davies) of 1000 cases of radiological delay under the speaker's care. Of these, 236 were unaware of constipation, and 764 complained of it. Of the latter, 670 were taking aperients, 436 every day. In 242 cases of mucous colitis and irritable colon, in roughly half there was or had been some other lesion or suspected lesion of the alimentary tract, the most prominent

being appendicitis, disease of the gall-bladder, and ulcers of stomach or duodenum. These cases should be observed carefully, and the practice of operating first and investigating afterwards avoided.

Under the heading of pathology, the view was put forward that sluggishness of the bowel leads to venous stasis, with diminished absorption of gas, and that interference with motility may be a cause of flatulence more than the usually alleged fermentation. Redundant loops were mentioned, and the *bacteriology* reviewed. Experimental grounds for indiscriminate vaccines were, said Dr. Spriggs, lacking. The estimate of what value they might have rested on a clinical and not on a scientific basis. Statistics of cultures were quoted, showing that streptococci were less common in constipated, and more so in loose motions. From the results of 2000 cultures it appeared that in the present state of our knowledge, repeated culture of the motions in these disorders, after the preliminary diagnostic examination for organisms known to be pathogenic, was not worth the time and labour involved.

The chief symptoms were: abdominal pain or discomfort, 80 per cent.; poor appetite; nausea, 24 per cent.; vomiting, 16 per cent. Constipation was usual and many complaining of diarrhœa showed with X rays delay in the bowel. The incidence was also given of weariness, depression, headache, malaise, palpitation, heart pains, shivering and cold hands and feet. Among signs it was mentioned that in 111 cases the gastric juice was superacid in 41 per cent.; subacid in 23 per cent.; achlorhydric in 2 per cent. As regards colonic delay, proved radiologically in the 1000 cases quoted, the delay was in the whole colon in half, and in the sigmoid or rectum, or both, in one-third. Cæcal delay alone was rare (1 per cent.), and often means local inflammation; 289 complained of headache and 181 were depressed or neurasthenic. Stress was laid upon inspection of the motions.

The main rules of treatment were these: to allay anxiety, to abolish laxatives and purges, to give a suitable diet, and to regulate rest and exercise. In severe cases it might be necessary to remove the patient for a long period from surroundings in which the derangement arose. The patient was often convinced that it was harmful for material to lie in the colon for more than 48 hours; that if an action did not take place in the morning an aperient should be taken that evening, that the large semi-fluid motions produced by aperients, to yield which a great part of the colon was emptied, were beneficial; that an ordinary formed motion due to the emptying of the lower sigmoid was not enough; that abdominal disorder and loss of vitality were lessened by the use of aperients. In the main, said Dr. Spriggs, these opinions were wrong and he gave reasons for thinking so. Diet suitable for different cases varied from a bland one in severe cases (used in 42 per cent. of this series) to a rougher diet in milder ones. The use of paraffin, massage, baths, intestinal douches, exercise, electrical treatments, rest (including mental rest), and other measures was discussed. Drugs such as belladonna, hyoscyamus, intestinal antiseptics, castor oil and salines, were mentioned, also special measures for severe mucous colitis, spastic cases, and nervous diarrhœa.

Experience of surgical operations for functional disorders of the colon was, said Dr. Spriggs, unconvincing. No operation had been or would be devised which would make a man out of training fit to run a race. In these patients the bowel was out of training and surgery as a means of restoring its powers is usually futile. The results of the treatment of 208 cases were quoted. 34 per cent. were treated in bed at first, 64 per cent. with douches, 11 per cent. wh castor oil. In 90 per cent. much benefit was obtai from a course averaging 6·7 weeks in length. If t be given relief is nearly always possible and cur frequent. Each patient should follow detailed instr tions under the care of his doctor on returning ho

"These diseases do not kill," the speaker conclud "but they cause weakness and misery. If we educate doctors as a profession and the public regard to the hygiene of the colon, a great addit will have been made to human health and happine

DISCUSSION.

Dr. E. E. CLEAVER (Toronto) gave an account modern work upon the structure and functions of colon, its movements, control by nerves, and, shown by Hurst, its lack of sensation except at lower end. Digestion, absorption, and secretion the lower bowel were assessed, the main funct being that of a reservoir. Much prevalent deran ment could be avoided if the diagnosis were made the doctor and not by the patient.

Dr. HUGH BARBER (Derby) said these disord could often be cut short. Although predisposed by a sensitive nervous system, they occurred at periphery, and were only partially controlled by central nervous system. Thus, in nervous diarrh belladonna with bromide would quiet the irrita colon, and the patient then finds that faith wo play its part, the peripheral control teaching a les to the higher centres. Fatigue was a cause—e.g., a schoolmaster at the end of term. Mucus was due too much purgation as well as to hard fæces. T intractable chronic states would seldom occur if doctor had had a chance to advise or control at beginning.

Prof. THOMAS MCCRAE (Philadelphia) put nerv predisposition first in his list of causes, and constipat with the use of laxatives second; later, the probl was a mixed one. He spoke of the harmful characte some popular health articles, and of advertiseme of aperients and food fads in the lay and medi press. The word "autointoxication" ought, said, to be cut out of the terminology. Orga states must be excluded and especially diverticulo The prostate should be thought of also in m Allergy in this class of disorder might be striking, examples were uncommon. He agreed with Spriggs's conclusions about aperients, viscerpto bacteriology, and the importance of inspection of whole stool, not a sample. Some needed a spec diet, but in others the best therapy was to tell them forget both diet and colon. He used irrigation, less than formerly. The value of surgery in th complaints was illustrated by the reply of a scho boy to a question about Caligula. Knowing nothi he wrote, "the less said about Caligula the bette and received full marks.

Prof. T. GILLMAN MOORHEAD (Dublin) said t the function of the colon was of importance, but its position. It was undesirable to make a diagno to the patient of dropped colon, as it was hard aft wards to get the idea of abnormality out of his or head. Abdominal belts should not be used unl the abdomen was pendulous. He agreed with t strictures on the abuse of aperients, but they co be taken in moderation for years by those who w not nervous without harm.

Prof. WILLIAM WRIGHT (London) said that refl mucous colitis was especially likely to be caused disease in structures, such as the hip and the prosta which were supplied with nerves from the same p of the cord as the sigmoid. The great variations

e anatomy of the lower colon must not be forgotten. ie rectal valves might form an almost complete aphragm, or the ampulla be large, causing lodging fæces with mucous discharge.

Lord DAWSON OF PENN agreed with the retention the term "colitis" for these cases. Labels were eded and the doctor should not mistake them for e things labelled. The tendency to an unduly sponsive abdomen was inborn and was associated th low blood pressure. The high tension patient ok the strain in other ways. He was satisfied that tulence was due to disturbance in motility more an to fermentation; in some the distension came on idly from mental causes. Many of those people re attempting more than they could do, trying to t a quart into a pint pot. Attacks in some were ught on by taking food too soon after fatigue and posure, and could be avoided by resting and rming the extremities before the meal, which uld then be simple, sometimes just bread and milk. herwise diet should not be strict because such ail raises the abdominal consciousness. Exercise needed, but many overdo it at week-ends. Repose body and mind for half a day or a day a week s recommended. He had the impression that pancreatic and duodenal preparations were sometimes value, and, for the overstressed, bromide and alin. He endorsed the necessity of understanding patient's outlook, and allaying hidden fears and interpretations. This was best done by incidental versation, plain reasons being given for the advice dered.

Dr. EMMET KEATING (Chicago) said it was of cial importance to avoid palatable aperients. He d Epsom salts which, on account of the unpleasant te, the patient would be less likely to take to excess.

REPLY.

Dr. SPRIGGS said that most of his patients in this ies had a low blood pressure. The average of the cases was 128/77, and the average age 43. Dr. rst's account of the gastrocolic reflex had been firmed by Mr. Marxer. He was interested in f. Wright's reference to the nervous supply of sigmoid for left sciatica, and herpes of the lumbar sacral nerves were, he had found, unduly frequent h lesions of the sigmoid, especially diverticulosis. e preparations were sometimes useful. Purges, if ded, should be prescribed by the doctor like other licines. If a belt was to be used for a dropped mach or colon, its efficiency should be tested by ening with the belt on and off, with some barium he stomach or colon, or both.

Sea Sickness.

Dr. T. GWYNNE MAITLAND (Liverpool) described ong and interesting series of observations by self, Group-Captain Martin Flack, R.A.F.M.S., Dr. J. R. Marrack. He discussed the kinds of vement that cause vestibular nausea, referring to pitch, roll, yaw and ascent of a ship at sea; also lane and train sickness. Quick movements, such rotting on horseback, do not cause these symptoms. points were illustrated by models of the internal and by a revolving chair. Although the complaint not its former terrors, there was no panacea; and e seasoned sailors never became immune. The s that in many equilibrium soon adjusted itself that the average storm abates in two or three days e sometimes forgotten when the value of remedies assessed. They had tested, with controls on the e ship, over 70 proprietary remedies. None of se was a certain preventive or cure.

SECTION OF SURGERY.

ON the second day of the meeting this Section held a symposium on the uses of

Radium in Surgery.

With one exception the contributors were British workers, and the discussion as a whole gave an adequate presentation of the recent work on radium in this country. It was the more to be regretted, therefore, that no one was present who could give an account of radium treatment of cancer of the breast, such as has been carried out during recent years at St. Bartholomew's Hospital.

CARCINOMA OF THE RECTUM.

The discussion was opened by Sir CHARLES GORDON-WATSON (London), who reported his recent work on the treatment of carcinoma of the rectum. One of the great advantages offered by radium was the possibility of curing the disease without recourse to the colostomy that was inevitable during some stage of treatment when present-day surgical methods were employed. The problem of radium versus surgery, however, was complicated by the recent work of Cuthbert Dukes on the spread of cancer of the rectum. This work suggested that it was not necessary to excise the rectum completely in order to obtain thorough eradication of an early carcinoma which had not penetrated the wall of the rectum. If this work was substantiated it might be possible in the future to obtain a cure by more limited operations than were at present used, and without recourse to permanent colostomy. There was no doubt, Sir Charles said, that an early growth of the rectum could be destroyed by radium, without colostomy and without disturbance of the function of the rectum, but no observations were as yet available on a five-year basis.

He had, he said, treated 121 cases of carcinoma of the rectum with radium. Small growths could be destroyed with little or no resulting deformity of the rectum. The adenocarcinomas varied greatly in their radio-sensitivity, and it was desirable that attempts should be made to grade tumours histologically, and to correlate such findings with the radio-sensitivity of the tumour. Unexpected failures had been encountered in the radiation of early growths, but fortunately these failures could be made good by surgery. Rapidly growing adenocarcinomas in young people were more radio-sensitive than slow-growing tumours in elderly patients. In these the dose of radium required to secure complete retrogression of the tumour was very near the margin of tolerance of healthy tissues, and consequently radium burns were difficult to avoid. β-radiation should be reduced to a minimum. The speaker had used filtrations of 0·5 or 0·6 mm. of platinum, but in the future he intended to increase this filtration to 0·8 mm. He left the needles in the tumour for ten days. Radium was preferred to radon because of its uniform intensity of irradiation. For tumours of the perineal portion of the rectum, the results so far obtained were too uncertain to justify the preference of radium to surgery in the operable type of case. Carcinomas of the rectum that lay above the peritoneal reflexion were treated by radium when the tumour was fixed or when, in operable tumours, the age or state of health of the patient forbade an abdominal perineal excision. Transperitoneal radiation was essential in these cases, and it was a more risky procedure than perineal radiation, for there was danger of infection and consequent paralytic ileus or general peritonitis. Radon seeds were less dangerous than radium needles inside the peritoneal cavity,

but so far the end-results when radon was used were not encouraging. Radon or radium was also used inside the peritoneum for barrage treatment of the mesenteric glands. The speaker mentioned one excellent result in which an inoperable tumour fixed both to the bladder and to the sacrum had been treated by radium needles, and the patient was alive and well, with a normally acting rectum, three years after treatment. In other cases great symptomatic improvement had followed the use of radium.

Sir Charles then discussed squamous-celled carcinoma of the anus. This tumour responded much better than any of the others so far considered, and in early cases, immediate initial cure could be obtained by radium. The consequent avoidance of colostomy rendered this method preferable to surgery. The various methods and routes by which radium could be applied to carcinomas of the rectum were then considered, and the speaker closed with a plea for team-work between the physician, surgeon, pathologist, biochemist, and physicist to enable the radium worker to conduct his practice on a scientific rather than an empiric basis. He also showed a film illustrating implantation of radium needles into a rectal carcinoma by the perineal route.

ORAL CARCINOMA.

Radium treatment of carcinoma of the mouth and tongue was the subject of the next three papers by Mr. STANFORD CADE (London), Dr. DOUGLAS QUICK (New York), and Dr. G. E. BIRKETT (Manchester), whose paper was read by Prof. A. H. BURGESS. In many aspects there was remarkably close agreement between these three workers, and as a result there emerged a fairly authoritative declaration of the methods of treatment of buccal carcinoma. For treatment of the primary carcinoma all were agreed on the advantages of radiation over surgery, but whereas Mr. Cade and Dr. Birkett favoured radium needles, Dr Quick preferred radon seeds. In the opinion of the first two speakers it was difficult with seeds to obtain a uniform intensity of radiation, not only because the intensity of the radiation rapidly diminished within a period of four days, but also because the small seeds could not be so accurately placed as the larger needles. Carcinoma of the posterior part of the tongue, especially in or near the vallecula, and the lingual tonsil, was much more radio-sensitive than the more differentiated carcinoma of the anterior part of the tongue, but it was prone to give rise to early metastases. For the treatment of metastases of the neck that were operable, all the speakers favoured free surgical excision on the lines laid down by Crile. They stressed the importance of very radical removal and urged that the operation should only be carried out by those who were especially trained and practised in its performance. An incomplete dissection of the neck was worse than useless. When there were large inoperable metastases the glands should be actively treated by radium needles in large doses and the balance of opinion favoured open operation as the method by which this treatment should be carried out. For early cases in which no palpable metastases could be found there was sharp divergence of opinion as to the treatment of the neck. Dr. Birkett advocated a waiting policy, provided the patient reported for examination once a month. Mr. Cade and Dr. Quick, on the other hand, believed that the neck should never go untreated. Mr. Cade advocated needling of the neck by the closed method, or as an alternative external treatment by means of a radium collar. Dr. Quick employed heavily filtered high voltage X radiation, and more recently a four-grain radiu element pack. Speaking of the radium bomb at t Westminster Hospital, Mr. Cade felt that it was t early to form a judgment of its value, but he did f that it was not an economic method of using radiu for the same amount of radium used in the form needles would treat ten patients where only one co be treated by the bomb. Dr. Quick stressed t importance of cleaning the mouth before treatment the neoplasm was begun, and as a preliminary irradiation of the primary tumour, he recommend external irradiation of the neck and the site of t primary growth for a period of two weeks. T results of treatment reported by the speakers cann be adequately reported in abstract, but the impressi formed was that radium treatment gave results th were definitely better than those of surgery alo especially when it was remembered that healing w attained with no impairment of speaking, eating, a drinking. Dr. Birkett made a strong plea for t concentration of radium treatment at large centres.

CARCINOMA OF THE BLADDER.

Mr. FRANK KIDD (London) reported the resu of treatment of 32 cases of carcinoma of the bladd by radon seeds after preparatory diathermy. some cases the treatment was administered by op operation, in others by the cystoscope. Sixte cases were alive and well for periods up to eight yea and two others were still living, but showed eviden of recurrence. In some of the fatal cases the u of radon had appeared to accelerate the course of t disease. It was sometimes difficult to estima accurately the extent of the tumour, even at op operation, and the results were still not predicta with any certainty. There had been some ve encouraging results, and further work along the lines was indicated.

CENTRAL NERVOUS SYSTEM.

Mr. HUGH CAIRNS (London) reported on wo done during the last three years in the use of radiu in the central nervous system. For a variety reasons it was highly desirable that radium shou be given an extensive trial in the treatment malignant intracranial tumours. These tumours we unlike most of those hitherto treated by this metho as they did not give rise to systemic metastas The greatest problem of the neuro-surgeon in doi radical extirpations of infiltrating intracranial tumou was to avoid maiming the patient by removi healthy nervous tissue. If radium could be sho to have a selective action on malignant gliomas, great advance would be achieved in the treatment these tumours. Results so far observed gave eviden that in certain types of glioma radium had a destructi effect on the tumour. It was too early as yet pronounce on the results of radium treatment in th field. In assessing the results it was necessary distinguish clearly between symptomatic improv ment that followed relief of hydrocephalus and th which was actually due to destruction of tumo tissue. The methods of using radium and radon intracranial tumours were briefly described.

GENITO-URINARY TRACT.

Mr. CLIFFORD MORSON (London) discussed th radium treatment of malignant diseases of the genit urinary tract. By far the most favourable of these neoplasms was carcinoma of the penis. He h treated seven cases of this disease with radium, a had had six successful results. The one failure h been due to pyogenic infection.

Throughout the meeting emphasis was laid on the view that radium should not be regarded as a panacea for cancer. The whole discussion was conducted in a critical spirit. It was evident that much more work was necessary in all fields before the position of radium in treatment could be properly assessed, but the general attitude was one of cautious optimism.

The Sympathetic Nervous System.

On their final day the Surgical Section considered various aspects of the physiology and the surgery of the sympathetic nervous system. Dr. W. J. MAYO (Rochester, Minnesota) opened the discussion by giving an historical account of the discovery of the anatomy and physiology of the sympathetic ganglia and rami, mentioning the contributions of Winslow, Pourfour du Petit, Haller, Remak, Müller, Claude Bernard, and Gaskell and the Cambridge school. He pointed out that the surgical approach to the sympathetic involved the wider problem of the relation of this system to the endocrine glands. Dr. Mayo was unwilling to admit that removal of a single adrenal caused any permanent disturbance in the physiology of the organism, and he therefore questioned the wisdom of such a procedure in patients suffering from high blood pressure. In closing, he referred to the effect of ramisection on conditions such as arthritis, Raynaud's disease, and the Buerger syndrome, and asked whether certain kidney disturbances and coronary disease may not be an end-result of a similar vasospastic process, and whether early sympathectomy might not prevent the onset of angina pectoris and allied disturbances.

THERAPEUTIC RAMISECTION.

Dr. N. D. ROYLE (Sydney, Australia) followed with a paper entitled the Clinical Results following the Operation of Sympathetic Ramisection, in which he stated that he had performed the operation 100 times, with a mortality-rate of 0·5 per cent., —i.e., three deaths. The operation was introduced by him originally in October, 1923, for the treatment of spastic paralysis, and, excluding extrapyramidal conditions, 70 per cent. of the patients so treated have, he said, been distinctly benefited. A large proportion of them have been followed carefully, and end-results were summarised. More recently Dr. Royle had used the operation experimentally for treatment of the following conditions: parkinsonian rigidity (results poor); Hirschsprung's disease (results excellent in all cases); sarcoma of the femur (relief of pain); Raynaud's and Buerger's diseases (results gratifying, better, however, in the former condition); writer's cramp (one case, relief); poliomyelitis (results poor); condition simulating tic douloureux (one case); retinitis pigmentosa (five cases; recovery of vision following extirpation of thoracic sympathetic). The most important new development relates to Dr. Royle's discovery that retinitis pigmentosa responds to sympathectomy to a degree that caused the recovery of 20/30 vision in one patient whose visual acuity had previously been reduced to shadow perception. Royle still enthusiastically favours the operation of ramisection in cases of spastic paralysis.

PHYSIOLOGICAL PRINCIPLES.

Dr. J. F. FULTON (Oxford), who discussed the physiological basis of the surgery of the sympathetic system, described first the relation of this system to the general physiology of the organism, mentioning Claude Bernard's prediction that regulation of the internal activities of the animal body is carried out by the nervous system, and alluding to the recent discovery that the centres of the autonomic system lie in the hypothalamus (J. Beattie, G. R. Brow, and C. N. H. Long [1]). In discussing the mechanism of postural responses, Dr. Fulton pointed out that the stretch reflex, which is at the basis of posture, is abolished by sectioning of either the posterior or the anterior roots, but not by sympathectomy, although the transient diminution in rigidity occurring in spastic cases after ramisection suggests that the operation may cause an increase in threshold for eliciting the stretch reflex. From the physiological point of view the justification for the employment of ramisection in cases of hypertonia is still an open question. The operation of periarterial sympathectomy is without anatomical or physiological foundation —i.e., there are no long vasoconstrictor fibres passing distally in the larger arteries. The operation may, however, be useful for the relief of intractable pain. Apart from certain visceral conditions, such as Hirschsprung's disease, the only clear-cut indication for sympathectomy is ischæmia. Any pathological process in which healing would be greatly accelerated by an increased blood-supply offers an indication for ramisection, especially if the morbid process threaten the existence of an extremity. Since collateral circulation in a limb is established more readily after ramisection than with vasoconstrictors intact, an extremity in gangrene from thrombosis should not be amputated without first giving it the benefit of ramisection. It was emphasised that conditions improved by sympathectomy are not due necessarily to hyperactivity of the sympathetic.

SUCCESSFUL OPERATIONS.

Dr. J. R. LEARMONTH (Rochester, Minnesota) emphasised that the action of both parasympathetic and sympathetic nerves upon the bowel and bladder should be regarded as a means of harmonising an important physiological necessity—the disposal of the waste products of the body. Operations upon the sympathetic nerves of the bowel are indicated in cases of nervous imbalance, such as Hirschsprung's disease, and constipation due to dulling of the defæcation reflex. He described a new operation by which the whole sympathetic nerve-supply to the lower colon, the rectum, and the internal anal sphincter could be interrupted, with preservation of the vasomotor nerves to the limbs. In the case of the bladder, he described two cases in which defective micturition, due to lesions affecting the parasympathetic pathway, had been rectified by division of the sympathetic nerves to the bladder, and advanced the hypothesis that these nerves might mediate an inhibitory action on the musculature of the human bladder. He also described cases of vesical dysfunction which had been benefited by removal of agents compressing the dural sac under a lumbar or sacral spina bifida occulta. The operation of total denervation of the bladder was also referred to.

Dr. R. B. WADE (Sydney, Australia) gave a report of progress concerning the treatment of Hirschsprung's disease. He has now carried out left-sided lumbar ramisections for this condition in 14 cases, and has had striking improvement in all but one instance, with the establishment of regular bowel movements and normal control of the anal sphincter. The unsuccessful case responded temporarily, however, when the rami on the right side also were sectioned. The unilateral operation has been employed in many cases of chronic constipation with satisfying results. Dr. Wade is of the opinion that Hirschsprung's disease is due chiefly to over-action of the O'Beirne sphincter.

[1] Proc. Roy. Soc., B., 1930, cvi., 253.

VASCULAR CHANGES IN EPILEPSY.

Prof. W. G. PENFIELD (McGill) read a paper on Vascular Changes Observed in the Brain during Epileptiform Seizures. He mentioned at the outset that he had been able to demonstrate small medullated nerve-fibres supplying a large proportion of the cerebral blood-vessels; he then described three cases of epilepsy in which, during exposure of the brain under local anæsthesia, sharply circumscribed areas of anæmia appeared at several points in and about the motor area in the course of several carefully studied focal seizures. In the second case, one of the recorded seizures consisted merely of clonic twitching of the eyelids and turning of the eyes to the right, and the seizure was associated with an isolated area of chalky pallor in an area corresponding to the frontal eye field. In some circumstances the larger cerebral arteries were seen at several points to constrict sharply, giving a beaded appearance to the whole vessel. Dr. Penfield concludes that since stimulation of the sympathetic never causes such extreme vasomotor activity, the cerebral vessels must receive some innervation other than the sympathetic, and therefore that surgical extirpation of the sympathetic in epilepsy is of dubious value.

PERIPHERAL VASCULAR DISEASES.

Dr. A. W. ADSON (Rochester, Minnesota), who dealt with the Indications for, and the Therapeutic Value of, Sympathetic Ganglionectomy and Trunk Resection in the Treatment of Peripheral Vascular Diseases, mentioned the two existing theories concerning the origin of Raynaud's disease; one, upheld by Lewis, who maintains that the vascular spasm is due to a purely local condition in the tissues affected, while Adson and others contend that the disease results from hyperactivity of vasoconstrictor reflexes, and that the fault, therefore, lies in the central nervous system. Dr. Adson pointed out that in his cases, after complete removal of the vaso-constrictors supplying the lower limb, it is impossible to evoke vasomotor spasm, however intense the stimulus. The occasional persistence of spasm in the upper extremities was attributed to failure to remove all fibres. The more favourable results from the radical procedure recently introduced for the upper extremity supports this inference. At the Mayo Clinic the suitability of a case for operation is determined by a "vasomotor index"—i.e., the ratio of the rise of temperature in the extremities to that in the mouth in fever produced by injection of typhoid vaccine. Adson also has proved that retinal arteries dilate after thoracocervical ramisection. In concluding, Dr. Adson showed his first case of Raynaud's disease operated on five years ago, which had remained free of symptoms during that period (lower extremities), and also a case of Buerger's disease in which the morbid process had been successfully arrested in the upper extremities two years previously.

At the end of the discussion, Lord MOYNIHAN read in title a paper by S. H. HARRIS and R. G. S. HARRIS, of the Urological Department of the Lewisham Hospital, Sydney, on Renal Sympatheticotonus and Renal Sympathectomy. The operation which they describe was introduced in the hope of relieving certain obscure cases of persistent renal pain. The paper detailed the nerve-supply of the kidney, the operative technique for denervation of the kidney, and the indications for the new procedure. Pain associated with delayed emptying of the renal calices and pelvis, together with dilatation of the pelvis, constitute the chief positive signs. The writers propose to consider at a later time the relation this operation to nephritis and essential hæmaturi

DISCUSSION.

In the discussion which followed, Dr. ROBERTSO (Toronto) described a case of spastic paralys operated on in his clinic by Royle three years ago, i which the result was distinctly favourable, and h remained so. He also mentioned several cases arthritis and of Hirschsprung's disease, which hav been successfully treated by ramisection.

Dr. FLOTHOW (Seattle) said that he had see Dr. Royle's cases in Australia, and could confirm h claims. He then described a case in which som months after lumbar ramisection a cervical ganglio ectomy was performed, and during the gener hyperthermia (108°) which followed operation th lower extremity, whose lumbar sympathetic chai had been removed, showed evidence of extrem vasoconstriction.

Lord MOYNIHAN said that surgery was now enterin an era which might aptly be termed an era of physio logical repair. The divorce of physiology and anatom that supervened at the close of the career of Sharpe had been unfortunate, and its ill-effects had persiste up to the present time. Lord Moynihan, howeve seemed to discern the restoring hand of the surgeo The synthetic action of surgeons begun by Dr. Royl was bringing physiology and anatomy together agai not by means of animal physiology, but by means o human physiology. The inaugural symptoms o disease should be studied by those who were familia with normal physiology rather than with the patholog of the post-mortem room.

SECTION OF MENTAL DISEASES AND NEUROLOGY.

THIS Section met under the presidency o Sir FARQUHAR BUZZARD (Oxford), and its firs discussion was devoted to abnormal mental an nervous conditions associated with

The Menopause.

Dr. GEORGE RIDDOCH (London) began by definin the involutional period as that phase of life durin which the reproductive functions diminish and becom finally extinct. He pointed out that men, as wel as women, experienced this period of involution although usually to a less degree. In women th climacteric period was a general reaction to ovaria deprivation. Much was still unknown about th nature of the reaction, but it was clear that th primary response was due to other endocrine glands more especially those in most intimate functiona relationship with the ovaries. Of these the supra-renals, pituitary and, in particular, the thyroid, played a leading part. Involved in the reaction was the nervous system, through its autonomic or vegeta-tive portion, which was delicately influenced by, and in turn influenced, the so-called ductless glands, especially the thyroid and suprarenals. The reaction might be towards an increased or diminished activity, which was not uniform but in general varied with each gland, and also with individual constitution. Many of the symptoms of the climacteric were due to this glandular imbalance.

Maranon, said Dr. Riddoch, had insisted on the recognition of three stages in the clinical picture of the climacteric: (1) premenopausal, (2) menopausal, and (3) post-menopausal. Among the more usual symptoms and signs the most noteworthy were

motional instability, vasomotor reactions, and change
n sexual feelings. The tendency to hot flushes
as important not only on account of the physical
iscomfort to which they gave rise, but even more
ecause they aggravated the tendency to emotional
nstability.

Mental complications of the climacteric depended:
1) on constitution and temperament; (2) on the
motional and physical background; and (3) on
reconceived notions about the climacteric. They
ell into two groups—the psychoneuroses and the
sychoses. Melancholia was, he thought, the com-
onest expression of a psychosis and the picture of
nvolutional melancholia was distinct from the
anic-depressive syndrome. Other varieties of
ental disorder mentioned included chronic paranoid
sychosis, confusional insanities, and mental disorder
ith or without polyneuritis or some other organic
isease.

As regards prognosis, the speaker held that in the
sychoneuroses the outlook was largely dependent
pon how far the environmental incompatibilities
ould be overcome, and the attitude of the woman
ould be adjusted to the disappearance of youth and
productive functions. In the pyschoses the prospect
f recovery depended upon several factors, most
erhaps on the reaction type of the illness, but also
pon the physical health and general management and
are. Whatever the mental illness might be, the
rognosis was worse if it is complicated by cerebral
terio-sclerosis.

Treatment was discussed under the headings of
rophylaxis, glandular therapy, and psychotherapy.
n regard to prophylaxis, Dr. Riddoch thought that
good deal could be done for women who were
pproaching the climacteric. They should be
rotected from anxiety and their general bodily
ygiene should be kept at as high a level as possible.
hey should be reassured and reminded that "the
ange" was a normal process safely endured by the
ajority. He had obtained little success with the
arious glandular preparations. He attributed his
oor results partly to the lack of standardisation
f these products, and partly to the small dosage
ten advised by the manufacturers. Thyroid extract
ould be carefully used where there were signs of
yxœdema. Dr. Riddoch strongly opposed deep
ental analysis, by which attempts were made to
elve into unconscious processes. He thought this
ode of treatment not only unwarranted but actually
angerous. He advocated special homes for the care
f the psychotic.

STATISTICAL EVIDENCE.

Dr. C. B. FARRAR (Toronto) showed charts based
n admission to the Toronto Psychopathic Hospital,
etween the ages of 40 and 55 between June, 1928,
nd June, 1930. In this group there were 739
omen and 632 men, and the study seemed to justify
he conclusion that abnormal mental reactions during
he climacteric are more common in single than in
arried women; and that the maximum incidence
omes well before the normal climacteric period.
n males the peak is reached at a slightly later age.
r. Farrar thought there was always more than one
ausal factor operating. The more important of
hese he listed as follows: (*a*) exaggeration of
onstitutional traits, 47·5 per cent.; (*b*) physiology
f the menopause, 44·9 per cent.; (*c*) habitual
enstrual variation, 9·8 per cent.; (*d*) early involu-
onal changes, 8·1 per cent.; (*e*) psychology of
enopause, 1·6 per cent.; (*f*) factors independent
f life epoch, 26·2 per cent. Since over half of his cases were in good physical health he was not inclined to believe that physical disabilities were a potent factor in the production of abnormal mental reactions associated with the climacterium. He could draw no conclusions from his series regarding the occurrence of various types of physique. Pyknic and asthenic types were in the minority; 75 per cent. of his cases were discharged to their homes either completely recovered or greatly improved; 10·2 per cent. died in hospital and 15·2 per cent. were still in hospital. The length of hospitalisation varied from four and a half months to one and a half years.

CLINICAL VIEWS.

Dr. C. A. BARAGER (Brandon) maintained that the physical or structural changes of the menopause had not been sufficiently emphasised. Abnormal mental states are more common during the involutional period than at any other time. In his experience these states had been more common amongst women than men. He felt that recovery was to be expected. Early diagnosis from manic-depressive psychosis was often difficult or impossible. Schizophrenic reactions might also simulate the menopausal disorders. Prognostic results as seen by him were not as good as indicated by Dr. Farrar. Psychological changes, such as a change of outlook on life, played a great part in the production of these mental changes. A complete readjustment was necessary to everyone at this time of life.

Dr. J. G. MCKAY (Vancouver) believed that the outcome would be better if these cases were seen by the psychiatrist early. Differentiation of psychoneurosis from actual psychosis was often difficult, but each case should be treated according to its peculiar features rather than according to an artificial or arbitrary classification.

Dr. R. G. ARMOUR (Toronto) felt that the increased numbers of patients now taking advantage of mental hospital care was a good thing. The course of the illness in hospital patients was apt to be shorter than in those treated at home. He advocated the therapeutic use of ergotine and said he had had encouraging results with deep X ray therapy when this was begun early. This, however, involved early and accurate diagnosis. He admitted to poor results with glandular preparations.

Colonel HAMILTON, F.M.S., asked if the fact of a woman having borne children was likely to influence the severity and course of the condition. His impression was that women who had borne children got off more lightly than those who had not. He had used ichthyol therapeutically with good results. He was ignorant, however, of the rationale of its use, and expressed a desire to be informed.

Dr. RIDDOCH, in his reply, said he thought there was no essential difference between the so-called normal mental reaction of the climacterium and the psychoses, and that behind it all there was a physiological change. He said he spoke as one who saw early cases, in which the prognosis was usually good. The common factor in all forms of treatment was the influence of the doctor on his patient.

Dr. FARRAR closed the discussion. He said he felt sure that suicide was a danger in the psychoneurotic as well as the psychotic; and as the differentiation of severe psychoneurosis from psychosis was often difficult, the patient should be treated with the idea of suicide prevention in mind, even though it was not felt that an actual psychosis was present.

REVIEWS AND NOTICES OF BOOKS

Surgical Diagnosis.

By American Authors. Edited by EVARTS AMBROSE GRAHAM, A.B., M.D., Bixby Professor of Surgery, School of Medicine, Washington University. London: W. B. Saunders Co., Ltd. 1930. Vol. III. and Index. Pp. 1043. £7 10s. the set.

THE third volume and desk index now issued complete this work, of which the first two volumes were reviewed in THE LANCET, 1930, i., 866. The main subjects dealt with in the third volume are the thorax, the breast, the liver and pancreas, the rectum, the genito-urinary system, and the surgery of the central nervous system. In a work edited by Dr. Graham it is natural to turn first to the article on cholecystography in the section on diseases of the liver and bile-ducts. The author's fears that any reader might resent the amount of space devoted to this subject are groundless, for the pioneer of such a valuable method of examination is expected to give an authoritative account of its development, indications, and drawbacks. His descriptions are complete and very clear, and could not have been spared. The section on the breast is also full, is well illustrated, and contains a very readable account of the diagnostic problems of this difficult organ. The least satisfactory section in this volume, and indeed in the whole work, is that on diseases of the genito-urinary system. Starting on the assumption that urological diagnosis is essentially a specialty, the author attempts to set out general principles of diagnosis under the two heads of presumptive evidence such as should be gathered by the general physician, and positive findings which are the result of instrumental examination by a specialist. Even admitting that such a view may have its advocates, its exposition is lacking both in conciseness and clarity. This section consists solely of descriptive lists of the lesions of various parts of the tract, followed by extensive references to the literature in many languages, to which the reader must presumably turn for the information which he naturally expects the section to contain. A crowning incongruity is that this section, for whose synoptic form the only possible excuse would be lack of space, is followed by a chapter on bladder pressure in genito-urinary surgery in which nine charts of cystometrograms are given, whereas in the whole article on genito-urinary surgery there is only one picture of a cystoscopic appearance, and not even one of a pyelogram. The articles on the nervous system by Drs. Dandy, Adson, Dean Lewis and Ranson are admirable expositions of the subjects dealt with, and the illustrations in these sections are well chosen and reproduced. The inclusion of a desk index is a great convenience in a work of this size.

In the book as a whole there is much to praise. The majority of articles are clear and well balanced accounts by masters in their particular subject, and overlapping is in the main avoided. The paper, print, and illustrations could hardly be bettered.

A System of Clinical Medicine.

Eighth edition. By THOMAS DIXON SAVILL, M.D. Lond. London: Edward Arnold and Co. 1930. Pp. 1019. 28s.

THE special appeal of Savill's "Clinical Medicine" lies in the author's attempt to correlate all diseases by approaching them through their chief symptom The author tried to provide for the practitioner wh is faced with certain symptoms at the bedside, a guid which will lead him to the disease or syndrome fro which the patient is suffering. The book wa eminently successful in this object. Medicine ha however, expanded considerably, if irregularly, sinc the book was originally planned in one volume an it is now difficult to compress useful descriptions c the general features of each disease as well as suc aspects as prognosis and treatment into such a sma space. Within the limits available, however, th descriptions are admirable. Twelve pages have bee added to the eighth edition, and every part of th book has been revised. In addition to muc completely new matter the chapters on diseases of th lungs and liver have been recast, and the sections o the pancreas, mental diseases, urinary examinatio clinical bacteriology, and serum therapy have bee rewritten. The general editorship is still in th capable hands of Dr. Agnes Savill. The book i excellently produced, and the illustrations are vivi pictures, not mere blocks reproduced from catalogue or ancient text-books.

Intracranial Pressure in Health and Disease

Vol. VIII. of a series of Research Publication issued by the Association for Research in Nervou and Mental Disease. London: Baillière, Tinda and Cox. Pp. 519. 27s.

THE American Association for Research in Nervou and Mental Disease meets annually for the presentatio and discussion of original papers upon a commo topic, a practice which might with advantage b followed in other countries. It would be unreasonabl in a publication of the work submitted to look fo important discoveries. These cannot be produce to a conference time-table. The value of this, th eighth volume of the series of researches published b the Association, and its predecessors, lies in th opportunity given to the ordinary reader of bringin his knowledge of a subject up to date, an to the investigator of receiving some fertilisin impulse from the ideas of other workers at his ow problems.

This volume contains 31 communications divide into four sections. Section I. is devoted to the nature mechanics, and general investigation of intracrania pressure. H. S. Howe brings forward evidence i favour of the absorption of the cerebro-spinal flui into the cerebral capillaries instead of by the mor generally accepted route of the intracranial venou sinuses. L. H. Weed adds a further contribution t the many which he has made to this subject discussing, in particular, the influence of posture o cerebro-spinal fluid pressure. L. S. Kubie continue his important investigations of forced drainage of th nervous system, and there are other papers dealin with the experimental variation of the cerebro-spina fluid pressure. Section II. is concerned with studie of decreased and increased intracranial pressure an is the largest section in the book. D. Munro report an investigation of the cerebro-spinal fluid pressure i the newly-born, and advocates the reduction o raised pressures by lumbar puncture. J. B. Aye contributes an analysis of the lumbar cerebro-spina fluid in 67 cases of cerebral tumour. He emphasise the frequency with which some abnormality is found but does not consider that the findings are sufficiently

valuable to justify lumbar puncture in the presence of grossly increased intracranial pressure. C. Barnert advocates the determination of the systolic and diastolic blood pressure in the central arteries of the retina by the method of Magitot as an aid to the early recognition of increased intracranial pressure. W. R. Parker discusses the relation between the tension of the eyeball and the onset of papillœdema, the pathogenesis of which is well reviewed by C. Berens. The visual field defects associated with increased intracranial pressure are the subject of a communication by G. E. de Schweinitz. The two papers which follow are studies by G. B. Hassin and W. Penfield, of the pathological changes produced in the brain by pressure, and a paper on X ray changes in the skull concludes this section. Section III. deals with some aspects of intracranial tumours and includes a paper by W. E. Dandy on the mechanism and symptoms of tumours of the third ventricle and pineal body, with special reference to ventriculography in these cases. In Section IV. various methods of reducing the intracranial pressure are considered, the concluding chapter being on radiotherapy. Readers of the work will find in all the communications something of interest and value in the diagnosis and treatment of conditions causing increased intracranial pressure.

Photo-processes in Gaseous and Liquid Systems.

By R. O. GRIFFITH, D.Sc., and A. MCKEOWN, D.Sc., Lecturers in Physical Chemistry at the University of Liverpool. London: Longmans, Green and Co., Ltd. Pp. 691. 25*s*.

THIS volume maintains the high standard set in the text-books of physical chemistry which are being edited by Prof. F. G. Donnan. It contains nearly 600 pages and deals with only one aspect of physical chemistry—namely, photo-processes. The authors state that the foundations on which the present-day photo-chemists must build are those branches of modern physical theory which are concerned with the interaction of radiation and matter. The reader, then, will not be surprised to find that nearly one-half of this book is devoted to theories of atomic and molecular structure, atomic and molecular spectra, and photo-luminescence. The book gives a very comprehensive account of the photo-processes in gases and liquids, both on the theoretical and practical side. In the chapter on photo-stationary states the application of this theory to vision is ably discussed, but the reading is not easy, and readers must be prepared for a mathematical approach to the subject.

Angina Pectoris.

By HARLOW BROOKS, M.D., Emeritus Professor of Clinical Medicine, New York University. London: A. and C. Black, Ltd. 1930. Pp. 164. 8*s*.

So much has been written on angina pectoris that unless an author has something new to say, or at any rate believes that he can express the old views more clearly than did his predecessors, it is difficult to justify the production of yet another monograph on the subject. In the second chapter of Dr. Harlow Brooks's book we were led to hope that his own series of 350 cases would provide interesting material. Had he contented himself with giving a simple analysis of his findings in this group he would have made a useful contribution to the literature; but unfortunately he has preferred to rely chiefly on the observations of previous writers, and to treat the subject in a discursive fashion. In more than one place he fails to draw a clear distinction between ordinary paroxysmal angina and coronary thrombosis—the one aspect of the subject where a definite advance in knowledge has been made in recent years. The statement on page 65 that angina pectoris occurs almost exclusively in highly emotional and nervously sensitive persons is contrary to the experience of most clinicians. A long chapter is devoted to pseudo-angina pectoris, but it fails to give a well-balanced picture of the condition.

Heart Disease in Infancy and Childhood.

By CHARLES HENDEE SMITH, B.S., M.D., Professor of Clinical Diseases of Children, Columbia University; and LUCY PORTER SUTTON, B.A., M.D. London: D. Appleton and Company. 1930. Pp. 259.

THIS monograph deals not only with heart disease but with rheumatic fever in general; for, as the authors point out, rheumatic carditis is by far the most important type of heart disease in children. They rightly lay stress on the fact that acute rheumatism should be regarded as a general infection involving the joints, heart, and brain in varying degrees, and not as an acute arthritis in which cardiac involvement is a secondary complication. Arthritis, chorea, and carditis may all be primary lesions, and it is wrong to regard the last merely as a sequel of one of the other two. In the chapter dealing with the systematic examination of the heart, the usual routine of considering in turn the phenomena revealed by inspection, palpation, percussion, and auscultation is abandoned. In its place the authors deal with heart size, action, sounds and murmurs, describing the various criteria which yield trustworthy information about cardiac enlargement, disorders of the cardiac mechanism, and valvular lesions respectively. Some of the more conservative clinicians will doubtless regret this innovation, but generally it will be welcomed. In cardiology the introduction of new methods of investigation necessitates a reconsideration of the relative values of different diagnostic signs. Radiography, for example, has shown that the position of the maximal cardiac impulse is generally a more reliable guide than percussion to the position of the left border of the heart, and it is time, therefore, for percussion to take second place. Two useful chapters are devoted to the electrocardiograph and X ray examination, but surely it should not be necessary to discuss here the interpretation of the normal electrocardiogram. The proper place for this is in the text-books of physiology or electrocardiography, and it should already be familiar ground to the clinician who is specialising in diseases of children. The classification of heart disease adopted by the New York Heart Association has been followed, cases being graded in accordance with the severity of their symptoms. To the same source we are chiefly indebted for the organisation of coöperating agencies which fulfil such an important function in the after-care of cardiac cases.

This monograph is the eighteenth volume of the series on Clinical Pædiatrics edited by Dr. Royal Storrs Haynes. It is apparently sold only with its immediate predecessors in the series, entitled respectively Prepubescent Syphilis and Diseases of the Skin in Infancy and Childhood, which were reviewed in THE LANCET earlier this year at 48*s*. for the three volumes.

MEDICINE AND THE LAW.

Panel Patient and Charge for Fees.

ALTHOUGH each case is based upon its own peculiar facts and possibly no two cases are alike, the decisions of the Minister of Health upon allegations of malpraxis in connexion with national health insurance medical benefit are of interest to many members of the profession. In a recent instance the following facts were established. A domestic servant pricked her thumb, which became septic. Happening to visit a friend on the following Sunday, she was persuaded that she ought to see a doctor. She thereupon went to her friend's insurance practitioner; for some reason not made clear, she did not go to the practitioner on whose panel she herself was. The doctor was at dinner when the patient and her friend arrived. He examined the thumb, put some white powder on it, and told her to come back next day and bring her medical card. She did so; he then lanced the thumb and stripped some of the skin from the pad of it. He gave her Form G.P. 26 authorising her to obtain cyanide gauze and bandages. She attended daily for a fortnight and at frequent intervals for the next few months. The thumb was again lanced two days after the first visit. Two days later the practitioner officially notified the insurance committee that the patient had been transferred to his panel. Subsequently the practitioner sent the insurance committee Form G.P. 45, giving notice that he had rendered the patient professional services and asking for approval of proposed charges to her on the footing that he had rendered such special services as entitled him to make such charge. The local medical committee and the insurance committee both agreed that the services were not such as to entitle him to charge the patient. The treatment for acute suppurative tenosynovitis (on which the claim for a fee had been based) was not, in their opinion, a service involving the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess. The Minister agreed and declined to refer the question to referees. The insurance committee therefore informed the patient that the service performed for her was one which came within the scope of medical benefit under the National Health Insurance Act and one for which she should not have been required to pay a fee.

Up to this point there was merely a difference of opinion as to the nature of services rendered. Later the medical practitioner contended that for the first five days of treatment the patient was his private patient. The inquiry committee found against him; the contention, they said, was inconsistent with the patient's evidence and with the use of Forms G.P. 45 and 26. The patient's employer was insured with a well-known company against Workmen's Compensation Act liabilities. The company paid the employer £25 in respect of the patient. The practitioner endeavoured to obtain payment of his fees from the company. The company declining to pay them, he then wrote a letter to the patient enclosing a detailed account of the services rendered in connexion with the injured thumb. "Excluding all those under the National Health Insurance Regulations, an inclusive fee of £30 would be very fair and reasonable, and I shall be glad of a settlement in due course." A copy of the letter was sent to the insurance company. The insurance committee decided that the practitioner "sought to obtain payment of money to which he was not entitled for treatment provide by him for the insured person concerned": th inquiry committee says this finding was ampl justified. The Minister dismissed the practitioner appeal, and the upshot of the case is that the pract tioner is ordered to pay £5 5s. towards the costs of th insurance committee on the appeal, a sum of £100 to be deducted from the remuneration payable t him, and he is formally warned that any recurrenc of similar conduct would be bound to reopen th question whether his continuance upon the Medic List is in the interests of the insurance medic service. The insurance committee's attempt t remove him from the List—a serious matter for practitioner with some 1200 patients on his panel- failed. There was no suggestion that he had neglecte his patients or tried to charge fees to other insure persons on his panel. He seems to have felt that h had a claim upon the £25 which the domestic servan had received from the insurance company. This, th inquiry committee considered, had been the motiv of his improper conduct. They point out, in fairnes to him, that all the steps taken to obtain paymen of fees were taken openly.

REPORTS AND ANALYSES

SPECIAL FINE OLD LISBON WINE (PRODUCE OF PORTUGAL).

(BARCLAY PERKINS AND CO., LTD., ANCHOR VAULTS, 5, CRUCIFIX-LANE, S.E.)

ON analysis this wine gave the following results:—

Alcohol by volume	16·6 per cent.
Equivalent to proof spirit	29·0 ,,
Total extractives	8·38 ,,
Consisting of sugar	6·5 ,,
Tannin, mineral matter and pectinous substances	1·7 ,,
Total acidity as tartaric acid	0·36 ,,

Preservatives were tested for with negative result The wine, which is of a rich ruby colour, woul appear from the analysis taken in conjunction wit its palate to be a pure wine of the port type. Whils its strength is a little below that of the usual run o ports, it may be considered a perfectly wholesom product, not tampered with or adulterated in any way At the present time the description "Lisbon Wine is somewhat under a cloud, as cases have bee reported in the coroners' courts of wines bearing thi name being prepared with methylated spirit. Suc synthetic concoctions have nothing in common wit the wine whose analysis appears above. Th Portuguese Embassy has given an assurance tha wines from Portugal are rigorously supervised an tested before being exported.

BARLEY SUGAR.

(MESSRS. BARKER AND DOBSON, LTD., EVERTON, LIVERPOOL.)

The barley sugar, which was transparent and of a dark amber colour, is conveniently packed in a glas bottle with precautions to avoid the admission o moisture, as it is decidedly hygroscopic. Whe analysed, the following results were obtained:—

Cane sugar	76·0 per cent.
Invert sugar	22·0 ,,
Moisture	2·0 ,,
Ash	0·05 ,,

The material had a slight but very pleasant flavou of lemon. The analysis shows that only materials o a very high degree of purity were used in the manu facture, and no confectioners' glucose is present The obvious care taken in the making and its ease o assimilation are points much in favour of this popula sweetmeat.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 20, 1930.

SURGERY OF THE SYMPATHETIC NERVOUS SYSTEM.

OPERATIONS have been performed on the sympathetic nervous system since the latter part of last century, but it is only within the last five years that this branch of surgery has shown any signs of bearing fruit. The Surgical Section of the British Medical Association chose the subject for one of their discussions at Winnipeg, and the proceedings (reported on p. 639) merit wide consideration because they touch on disease at many points and break the artificial boundaries of modern specialism.

Earlier operations on the sympathetic nervous system were for the most part concerned with division or removal of the cervical sympathetic chain. This operation was done for such diverse maladies as epilepsy, insanity, facial palsy, exophthalmic goitre, and angina pectoris. It was easy to perform and was not attended by any noticeable ill-effects, beyond slight alterations in the upper eyelid, pupil, and face of the corresponding side. For this reason the operation had a certain popularity although the benefits derived from it were mostly not obvious enough to ensure its general adoption. There is no need now to consider the various and even fantastic hypotheses on which the operation was based, except to say that cervical sympathectomy, as designed to cut afferent nerves of the heart for relief of angina pectoris, still has a certain vogue and is attended in some cases by relief to the patient. Leaving aside the operation of periarterial sympathectomy, which, as Dr. J. F. FULTON pointed out at the Winnipeg meeting, was largely based on false anatomical and physiological premisses, the next important event in the surgery of the sympathetic nervous system was in 1923 when J. I. HUNTER and N. D. ROYLE introduced the operations of ramisection. These operations were intended to relieve spastic conditions of the limbs, for, from their experimental work, HUNTER and ROYLE had been led to believe that the sympathetic nervous system influenced the tone of voluntary muscles. Their claims aroused much controversy. Undeterred by the untimely death of HUNTER or his own ill-health Dr. ROYLE has not spared himself in advocating his operation and has performed it in many countries. The subsequent condition of the patients has been reported on independently,[1] and the original experiments have been repeated and extended. The balance of opinion appears to be that influence of the sympathetic nervous system on the tonus of voluntary muscles is unproven and that the operation is not effective in relieving spastic conditions of the limbs. At the Winnipeg meeting, however, ROYLE reaffirmed his faith in the operation and in the underlying hypothesis and in this he was supported by some Canadian and American investigators. In addition he advocated cervical ramisection for the relief of writer's cramp, atypical neuralgia of the face, and retinitis pigmentosa. Whatever the outcome of HUNTER and ROYLE's original contentions may be, the profession is, as Lord MOYNIHAN pointed out, greatly indebted to Dr. ROYLE for beginning a new era of sympathetic surgery.

In the original cases of lumbar ramisection, though attention was focused on the state of the muscles of the lower limb, it was also observed that limbs deprived of their sympathetic fibres became much warmer, and that a patient who had formerly been constipated had after operation free and frequent action of his bowels. These observations could be explained by existing physiological knowledge and it was at once perceived that they might have wide application in surgery. By removal of the greater part of the sympathetic trunk so as to divide vasoconstriction fibres, A. W. ADSON was able to improve the circulation of the lower limbs and thus to treat successfully Raynaud's disease. Later he devised an operation that proved satisfactory for Raynaud's disease of the hands. He has extended the scope of these operations and has obtained encouraging results in certain cases of thrombo-angiitis obliterans, scleroderma, and chronic arthritis in patients with cold extremities. The improvement obtained in Raynaud's disease has been so marked as to make him believe that this condition is due to excessive activity of vasoconstrictor fibres. The studies of Sir THOMAS LEWIS appear to show conclusively that this is not true, for LEWIS has been able to produce attacks of vascular spasm, resembling typical Raynaud's disease, in limbs which have been deprived of their sympathetic nervous supply by Adson's operation. Although it is probable that the operation thus does not treat the cause of Raynaud's disease, yet there is no doubt, as LEWIS himself has clearly shown, that it improves greatly the circulation in limbs affected by vascular spasm and that it has won for itself an assured position in surgery.

Following the first ramisections R. B. WADE, with the help of ROYLE, performed lumbar ramisection on cases of Hirschsprung's disease. At Winnipeg he gave a convincing report of the value of the operation in this condition, and also in some cases of chronic constipation, and his results were confirmed by J. R. LEARMONTH. LEARMONTH has opened up a new field of sympathetic surgery by dividing the sympathetic nerve-supply to the bladder in certain cases of defective micturition following myelitis of the sacral cord or other lesions which affect the parasympathetic system. Remarkable results have been obtained and it is likely that the operation will prove to have wider application in the treatment of imperfect emptying of the bladder that is of nervous origin.

[1] See, for instance, THE LANCET, July 19th, p. 127.

These operations on the sympathetic nervous system are anatomical dissections of parts of the body which are not affected by disease, and they can be easily performed by any surgeon who has a proper knowledge of anatomy. But no justice can be done either to the patient or to the subject unless the surgeon devotes himself also to the physiological side of his cases. As Dr. W. J. MAYO suggested in his opening address at Winnipeg, there will be great opportunities not only of extending the science of surgery but also of making important contributions to human physiology. The earlier surgery of the sympathetic nervous system failed because it was based on imaginative thinking rather than on accurate studies, of which the work of LEWIS may be cited as a model. If the complexities of the subject are not ignored we may indeed be approaching what Lord MOYNIHAN termed an era of physiological repair.

THE FUTURE OF CONTRACT PRACTICE.

Dr. GRAHAM LITTLE'S address to the Paddington Medical Society last week has had a good press, and was in fact more piquant than the précis on which newspaper comment was based. He thought it probable that a system of medical service under State control would be pressed upon the nation by the Government in the near future, and that the medical profession would have to face a crisis as grave as that of 1912 when the National Insurance Act took form. Dr. LITTLE himself has small use for contract practice of any kind, which he regards as unsatisfactory to the patient because it means the introduction of a third party whose first consideration is seldom the patient himself; and unsatisfactory to the doctor because his work becomes stereotyped in the keeping of books and collection of statistics. In addition there is the drawback inherent in the panel system that it induces the patient to have recourse to his doctor unnecessarily. Dr. LITTLE thinks that all this has lowered the prestige of the profession, but, it may fairly be argued that insured persons are visiting their panel doctor more frequently because they value his services more, not less. The unnecessary visits, as the *Manchester Guardian* suggests, may be a sign that the working classes are gradually losing that terrible fatalism about disease which has so often led them to wait until the doctor is undoubtedly required, and therefore often too late. A preventive visit now may dispense with the need for nine curative visits later on. The facts to which the Government Actuary has been calling our attention are possibly the first indication of the principle of preventive medicine getting into national insurance practice.

The first intention of the Act of 1911, as stated in its title, was to provide for insurance against loss of health and for the prevention of sickness. The cure of sickness came second, and insofar as medical benefit deals only with established illness the intention of the legislature has proved futile. The workers themselves are taking cognisance of this difference between intention and realisation. At the recent Trades Union Congress in Nottingham, Mr. ERNEST BEVIN, speaking for the Transport and General Workers, described the result of the panel system as a tragedy of incompetence. The medical service we get to-day, he said, is not in line with the developments of modern discoveries in the medical world. Mr. BEVIN went on to remark that any medical service that does not provide for adequate diagnosis as its first principle is not achieving its object, and he ended with an appeal to the medical profession to join with Parliament and the Government departments chiefly concerned in bringing their combined experience and knowledge to provide a well-organised, well-developed, well-trained, and (he was prepared to say) well-paid medical service to protect the health of the people. He invited the British Medical Association to sit down with the trade-unions and hammer out the basis of such a service; and the Association has, in fact, just issued, in the form of a sixpenny 48-page booklet, its proposals for such a general medical service for the nation, with an invitation to public bodies to comment upon and criticise them. A fundamental principle of this scheme is a provision of diagnostic aids, available for every individual patient.

It is hardly to be doubted that any such general service will be in large part on a basis of contract. Contract practice has come to stay; it has always arisen at a certain stage of social development, and it was not the principle that was new in 1912 but the introduction of a central umpire into a system which up till then had been administered, for better or for worse, by little groups up and down the country. What the conditions of contract practice were 35 years ago may be read in a series of articles, entitled "The Battle of the Clubs," written on first-hand information by a special commissioner of THE LANCET, and published in 1895–96:—

> "Some of these clubs," he wrote, "are uncommonly ill-managed, in that all persons, no matter what their condition of health or their means, are invited to enroll themselves, that they may be treated medically for a penny or two a week, drugs included. In certain of these institutions the management of the association having been, and remaining, entirely in lay hands, the interests of the medical officer suffer severely. These gentlemen are treated badly by the persons to whom they dispense charity. Their emolument is very small, and their work is very hard. The patients who might reasonably be expected to pay them as private clients are not ashamed to join the charitable associations—charitable to all save the medical man—and may even want to have their wives, children, immediate relations, and occasionally the stranger within their gates, all treated in return for one payment."

It was not the principle of contract practice such as this that was brought in by the Act of 1911, but rather the opportunities of collective consultation (called rather provocatively collective bargaining) which have increased the status of the contracting doctor and raised the average quality of the treatment given to an extent which is only overlooked by those who have short memories or who are politically biased. Mr. E. B. TURNER,

who is admittedly not enamoured of contract practice, told the meeting at Paddington that, in his opinion, the National Insurance Act had been working well for all parties in rural districts, although in towns and urban areas its success was less evident.

Any further extension of contract practice need not, however, necessarily be on a compulsory basis. In London, for instance, there has been growing up a voluntary contract system, run by doctors for doctors, which is described as combining the advantages of the national scheme without its disadvantages. For a capitation fee of threepence per week, paid in full to the doctor, the subscriber becomes entitled to medical and surgical treatment within the competence and skill of a general practitioner at the surgery or at his house, including all needful medicines. The scheme is growing steadily in London, where there are now 11,255 subscribers, a large proportion of them being in the Paddington and Kensington areas; and there are 30 or more such services now running in different parts of the country. The experience of those actually engaged in these services will be an important element in any contemplated change in the near future. A Labour Government, acting on the advice of its medical advisory committee, may come to some decision which will alter the whole practice of medicine in these islands; but history suggests that adjustments of this kind come gradually by common consent. The large majority of practitioners are party to a decision that the time is now ripe for the inclusion of dependents of insured persons under the national scheme. If there are alternatives which are working well in practice, they should be considered before any action is taken. Paddington is happy in having a forum for practitioners of all shades of medico-political complexion where an endeavour is being made to work out some agreed basis of procedure. The need is great for similar action in other areas.

THE BACTERIOPHAGE AND THE TREATMENT OF CHOLERA.

THE most interesting property of the bacteriophage, from the point of view of practical medicine, is its effect in the living body. It may be recalled that the bacteriophage is a principle which brings about the solution of bacteria and under favourable conditions their more or less complete destruction (the Twort-d'Herelle phenomenon). The nature of this "principle" has been ardently debated. If it is not a living entity, in our ordinary understanding of the word, its characters so closely resemble those of living organisms that in the absence of contrary proof the definition may be allowed to stand. The affected bacteria seem to become diseased; their osmotic tension increases; they swell, burst, and disintegrate. In the resulting solution the lytic principle—the bacteriophage—is present in an increased amount. The general phenomenon is nowadays a commonplace in the test-tube, and most of D'HERELLE'S contentions concerning its characteristics in this environment have been shown to be substantially correct. But in respect of its occurrence and effect in the living body very diverse opinions have been held. D'HERELLE has never ceased to teach that bacteriolysis takes place in vivo exactly as in vitro, and that it alone causes recovery from certain diseases. Nay, more, he is convinced that epidemics are controlled by this same factor. In his opinion a patient's recovery is brought about by intracorporeal genesis of a bacteriophage capable of destroying the organisms, whilst the cessation of an epidemic is due to the spread of this bacteriophage among the exposed population. This theory of infection and immunity, which is peculiarly D'HERELLE'S, has been applied by its author mainly to intestinal infections, since the bacteriophage is normally an inhabitant of the bowel; but it has also been extended to include other infections, such as those due to the staphylococcus and the hæmorrhagic septicæmias (plague and barbone of the buffalo). In the hands of D'HERELLE and certain others bacteriophage therapy has yielded very valuable results. On the other hand, many investigators—and probably a majority—report that it has had no influence of any significance, either experimentally or in practice.

It might well be argued that if one disease is more suitable than another for testing the efficacy of this treatment it is cholera. Here we have an acute infection in which the germ does not pass beyond the intestinal walls, and the conditions are, therefore, favourable to the working of specific antibacterial agents in the lumen of the gut. Moreover, the organism is relatively delicate and particularly apt for bacteriolysis, as was shown long ago by the classical studies of METCHNIKOFF and PFEIFFER, and others. We therefore turn with great interest to the reports of an investigation of the action of the bacteriophage in cholera which has been carried out by D'HERELLE, with the assistance of R. H. MALONE and M. N. LAHIRI. The work was done at the instance of the Government of India, and was financed by the Indian Research Fund Association. The results obtained, which constitute the most serious contribution to the literature of the subject which has yet appeared, have now been published in a special memoir.[1] This is divided into three parts, one of which deals with the bacteriology and bacteriophagy of cholera, one with the phenomena of recovery and the results of treatment, and the third with epidemiology and prophylaxis. The authors find that D'HERELLE'S claims for the efficacy of the lytic principle in the body are very fully confirmed. In the first instance they studied 23 cases of cholera which were treated at the Campbell Hospital, Calcutta, by the approved current method—that of Sir LEONARD ROGERS. Seven of the patients died. No specific bacteriophage therapy was attempted, and the observations were simply confined to examination of the dejecta for

[1] Indian Medical Research Memoirs. No. 14. By F. d'Herelle, M.D., Professor of Protobiology, Yale University; Major R. H. Malone, M.D., I.M.S.; and M. N. Lahiri, M.B. 1930.

vibrios and bacteriophages in order to demonstrate what was the normal mechanism of recovery. It was found that recovery was regularly associated with the appearance of a specific bacteriophage of high activity in the stools, whereas in fatal cases the bacteriophage was absent or showed little activity. "In all patients in whom the virulence of the bacteriophage (for the vibrio) is exalted and reaches a sufficiently high degree . . . recovery is the rule. The duration of the disease depends on the rapidity of the exaltation of the bacteriophage and the degree of virulence attained." Holding this view of the mechanism of recovery the authors of the memoir deny the intervention of humoral immunity as usually taught in any form. For them such serological signs of immunity as may accompany recovery are epiphenomena and have little or no causal relation to the fact of recovery.

From these observations the investigators proceeded to the direct examination of the effect of the bacteriophage in treatment. The patients were treated in their own homes and were to some extent selected, since they were all persons who had consented that the method should be used exclusive of all others. D'HERELLE argues that such selection is, if anything, inimical to good results, since only those in desperate case will agree to be the subjects of experiment; but of course the opposite is arguable too. Other cases in the same village, treated only by prevalent methods of oral medication, served as controls. The bacteriophage treatment, which was carried out by MALONE, consisted of an initial dose of 2·0 c.cm. of bacteriophage preparation in 10 c.cm. of water, followed by repeated administration of a similar preparation during the next three hours. When necessary the same procedure was carried out on the following day. Almost all the cases (198 in number) were derived from nine relatively small outbreaks in Punjab villages of from 450 to 3000 inhabitants. The results may be summarised as

Total cases 198

Treated with phage ..	74	Not treated with phage	124
Died	6	Died	78

This gives a death-rate of 63 per cent. in the untreated cases, which is about the normal death-rate from this disease, as against one of approximately 8 per cent. in those who received the specific treatment. A further analysis of the figures, with reference to the time of commencement of the specific treatment, gives results yet more favourable to the bacteriophage, in cases in which the treatment was commenced early. We note the curious fact which may have much significance, that where the bacteriophage was given subcutaneously as well as by mouth, the results were nothing like so good as when it was given by mouth alone.

We have several times had occasion to criticise reports on the use of the bacteriophage in therapeutics, and to throw doubt on their statistical value. The present figures are very striking and we have no complaint to make of their presentation; but it is regrettable that an even larger number of cases were not submitted to treatment before any final conclusions were drawn. It is not made clear whether the experiment was carried out in the season of greatest incidence of the disease—although this seems to be so from the epidemiological studies of RUSSELL and SUNDARARAJAN [2]—or in a period of lesser activity; nor are we able to judge how long the epidemics had been going on before treatment was started. These factors are of prime importance in assessing the value of the method. We also have in our hands a paper by L. SOUCHARD,[3] who, following D'HERELLE'S technique, treated 27 cases of cholera in Cochin China with far less fortunate results, in that only three of the patients survived. These circumstances make it all the more unfortunate that in a country where 40,000 deaths from cholera may be registered in a month in a single province [2] the total number of cases treated in what should be a vital inquiry did not exceed 74, while this essential part of the investigation only lasted six weeks.

On epidemiology and prophylaxis the views expressed by D'HERELLE and his colleagues are as heterodox as those already quoted. They believe, as we have said, that the epidemic is controlled and terminated by the agency of the bacteriophage. In nature this is brought about mainly by pollution of the water-supply by excreta of convalescents who harbour non-virulent vibrios which are similar to the variant types which may be produced in the test-tube by bacteriophagic action. Such vibrios are associated with a bacteriophage which preys upon them and is similarly potent for the virulent *V. cholerœ*. In India fæcal pollution of wells is a normal event, so that such a bacteriophage is readily disseminated. When this happens, it is maintained, the epidemic ends. So certain are the authors that this is the mechanism of recovery and immunity that they say that the vibrios recovered from convalescent carriers are always avirulent and associated with a bacteriophage, so that "it is enough to introduce a carrier into a community of susceptible individuals for the community to become entirely resistant." This is not merely heterodox; it is revolutionary. We may recall from the work of others, which may have some bearing upon the virulence of vibrios in carriers, that the fact that the severity of the cases declines as the epidemic progresses is well attested, whilst the special prevalence of non-agglutinating vibrios in epidemics has been repeatedly observed. D'HERELLE'S contention means that the disease is only transmitted by the incubating, early, or fatal case, and that in the absence of these there can be no cholera. A patient, according to this thesis, is only infectious until bacteriophagy takes place in his gut; he then recovers, becomes non-infectious, and a disseminator of a beneficent bacteriophage. The position of the variant and inagglutinable strains of vibrios is, of course, an old problem, and while D'HERELLE'S theory gives an entirely plausible explanation of their occurrence and their significance in convalescents, it must be remembered that the appearance

[2] Indian Medical Research Memoirs. No. 12. By Lieut.-Col. A. J. M. Russell and E. R. Sundararajan. 1928.
[3] Ann. de l'Inst. Pasteur, Feb., 1930, p. 126.

of a bacteriophage in recovery and its absence in fatal cases does not prove the causal relationship which he assumes. Evidence of this relationship may be supplied by the results of treatment, but it would also be useful to inquire into the relationship of the variant inagglutinable vibrios of low virulence, which are said to result from bacteriophage action, to the variants produced in bacteria by other environmental alterations such as the action of immune sera.

The report of D'HERELLE and his colleagues is bound to arouse intense interest, not only because cholera is an urgent problem, but chiefly because of its fundamental bearing on the problems of immunity and epidemiology. The pronouncements of the authors will be criticised as dogmatic for they show an airy disregard of work that conflicts with their own views. If their claims are confirmed a great and fundamental advance will have been made in the control of epidemic disease; but in making these claims they have undertaken a heavy responsibility.

ANNOTATIONS

THE BOARD OF CONTROL AND THE MENTAL TREATMENT ACT.

THE early mental case will always be a perplexing problem to the general practitioner and to the local authorities; there can be little doubt that it is to the public interest that much better facilities for early treatment should be provided than exist at present. Unfortunately this provision is costly and great care must be exercised in selecting cases likely to benefit. The Mental Treatment Act of 1930, the major part of which comes into force on the first day of 1931, permits a variety of means. Local authorities may establish admission hospitals on the basis of the Maudsley Hospital in London or they may contract with a general hospital for special pavilions. It is to be hoped that in future the mental wards in the old poor-law institutions will no longer be used for temporary treatment and observation of all cases indiscriminately. The school mistress with melancholia, the degraded alcoholic, the court case on remand, the senile dement—these should never be nursed in the same observation ward, as too often happens at present. The problem is admittedly difficult but the new Act makes its solution more possible. It is natural that the report of the Board of Control, which we summarise on another page, should open with a reference to this Act, since that measure has gone so far towards consolidating the ideals which the Board have at heart. They believe that the Act is epoch-making for several reasons. It is an encouraging sign of convergence between medical and lay opinion in matters connected with mental disorder. Voluntary patients who for long could be received in registered hospitals and licensed houses may in the future be received in our public mental hospitals; temporary patients may also be received for treatment without certification, so that the mental hospital will approximate much more closely than heretofore to the general hospital. The admission of these early cases, however, must be contingent upon the provision made by local authorities; the Board have no power to force an authority to provide accommodation, they can only criticise this accommodation in the interest of the patients. The impetus for better treatment and better building must, in the future as in the past, come from local public opinion. Another welcome feature in the Act is the ability to approve accommodation for mental patients in general hospitals, thus removing compartments which have so long been almost watertight. The Board attach great importance to the local survey of requirements which the Act enjoins, expressing their hope that the survey will envisage the mental health of the community as a whole and the needs of the future. If the Board have their way it will become possible for medical officers of mental hospitals to staff the new out-patient clinics recognised by the Act and for a skilled psychiatrist to be appointed as an after-care officer, at least in larger areas. Not the least important provision of the Act empowers local authorities to undertake or support research work which has hitherto been gravely restricted by their lack of power to make staff appointments. Hitherto it has been inadmissible for several mental hospitals to establish and maintain a central laboratory; the near future may see group laboratories linked up with universities or medical schools in a chain of research throughout the country.

AN ENGLISH HEALTH FILM.

Leyton Borough Council are responsible for the production of a propaganda film which was shown with success at the local picture houses during Health Week. The staging and preparation of the film has been the work of Dr. J. E. Cheesman, who has the unusual theory that a health film should deal with health rather than disease. Under the title "Better Health," the film is intended to appeal to all those who are interested in children and their welfare. In spite of the exigencies of the English climate the photography is good, and attention is captured at the outset by a few scenes from prehistoric life borrowed from the American production of "The Lost World"; absurd monsters are seen rooting in the primeval mud, and man—a healthy-looking savage—holds his own against disaster by his superior intelligence. The moral is stressed by a glance at a modern bacteriologist at work in his laboratory, and the scene passes on to school medical inspections, children at play, open-air classes, dental inspections, and a realistic representation of a dental extraction under gas on an expectant mother. At one point a company of children are seen under the spray bath, and at another the use of the fountain drinking tap—for which no cup is necessary—is demonstrated; a healthy disregard for nudity is exhibited by all the children photographed, who take their sunbathing as a matter of course. Boys at carpentry and girls at the washtub show an interest in their tasks, and the film closes with some hundreds of healthy children massed and cheering. The difficulty always encountered in this form of film work is to make the subject matter at once instructive and palatable to the public. Most patrons of the cinema have a natural resentment against education disguised as entertainment, and since cinema proprietors must supply the demand with which they are faced it is not easy to make a propaganda film which will pay its expenses on the

road, while the initial outlay must always be considerable. The Leyton film, Dr. Cheesman tells us, has satisfied nearly everybody; it was accepted by three film proprietors in Leyton during Health Week, and has been let out to other authorities since. Alterations and improvements can be made at any time when necessary, and it remains the property of the Council for use whenever required. We have also seen an American film of a similar type, entitled "A Day at Merrill Palmer School," which shows the routine in a nursery school. While the photography is even better than that of the English film, it suffers from interruption by excessive captions, and the interest is not so well sustained. One is struck by the large number of helpers who appear to be available, and who sometimes are present in the proportion of one helper to three children—a state of affairs which it is hard to imagine we shall ever rival in this country.

PROBLEMS OF BIRTH CONTROL.

THE seventh international Birth Control Congress was held at Zürich from Sept. 1st–5th. Though it was attended by representatives of eight different countries, the main contribution was made by speakers from Great Britain, the United States, and Germany. In Germany birth control is a political issue. It is opposed by conservatives and nationalists for several reasons of which, according to Dr. K. Soloweetshik (Leipzig), not the least important is "the resentment aroused in government and medical circles by the unfavourable attitude of the rest of the world towards Germany." In the minds of socialists, however, birth control is an essential part of a wider movement aspiring towards political and moral emancipation. It is carried forward on an emotional wave which also sustains the issues of free-love and abortion. Much fervour was expended by German speakers upon this last subject. One of them, Dr. W. Pust, stated that between 1900 and 1930 Germany lost five times as many lives through the practice of abortion as she lost in the late war; that the number of abortions induced annually was greater than the number of living births; and that it was unusual for a German married woman not to have had an abortion at least once in her lifetime. By many German speakers it was vehemently contended that a modification of the German penal code in regard to abortion would be followed by an amelioration in maternal health comparable to what was reported by Dr. Martha Ruben-Wolf to have taken place in Soviet Russia.

Two obstacles to the progress of birth control in Germany were described. The first was a paragraph of the "doctor's oath" in which the individual doctor is exhorted "to refrain from all things tending to reduce the population or strength of the people." The second is a clause included in the new draft of the penal code of the German Reich that: "the public recommendation of articles to be used for immoral purposes renders the offender liable to not more than two years' imprisonment." Hence the birth control movement in Germany is at an earlier stage than in this country. It is still, largely, in the crusading stage, and it has not yet become detached and self-critical.

As regards contraceptive methods and technique, several points of interest arose, and we will comment on two of them. In the first place the increasing experience of different investigators of the Gräfenberg ring is tending to weaken rather than strengthen confidence in the suitability of this method for any but carefully selected cases. In a paper devoted to his own method, Dr. Gräfenberg stated that he had now fitted 1331 patients with his various intra-uterine appliances. With the silk stars and rings, now abandoned, he had had 3·1 per cent. of failures; with the silver ring he had had 1·6 per cent. But his figures were not presented in anything approaching the detail that the conference would have liked. Dr. J. H. Leunbach (Denmark) reported having fitted the ring in 176 cases. From 23 of these it had subsequently to be removed, and from 22 it came out by itself. Four women lost the ring without knowing it; one woman became pregnant despite the presence of a ring which fitted well. In a much smaller series (15) Dr. Helena Wright (London) reported several unanticipated sequelæ, but the reports of Dr. Norman Haire (London, 270 cases) and Dr. Norbert Neufeld (Breslau, 30 cases) were more favourable. The general opinion of the conference seemed to be that the method best adapted to the requirements and capacity of the majority of women is a combination of a vaginal pessary—the Ramses and the Mensinga being the most favoured—and a spermicide. As regards the optimal size of pessary for average women—about which there has lately been correspondence in our columns—the statistical experience of the birth control clinics of the United Kingdom and United States is unambiguous. It is to the effect that large sizes are fitted in preference to small. Thus, at 26 American clinics through which had passed 36,804 women, the average sizes of pessary fitted were Nos. 70, 75, and 80. At 16 British clinics that had dealt with 45,321 women, the average sizes were 70, 72½, and 75. Of the 42 clinics whose records of sizes were submitted to the conference, the Cromer-street Clinic, in London, and the American clinic at Reading, Pennsylvania, fit the smallest sizes. The average sizes here used are 10–15 mm. smaller than the average for all the clinics.

DEATHS UNDER SPINAL ANÆSTHESIA.

THE statistics of anæsthetic fatalities are notoriously unsatisfactory. The data on which conclusions are based are at once insufficient, numerous, and variable. The cases never afford really fair comparison between the various methods and drugs, for either the patient or the operator or the operation is always different. These facts are well demonstrated in a paper[1] on spinal anæsthesia fatalities which contains a number of interesting and instructive instances of deaths associated with this form of anæsthesia. In the vast majority of the cases cited the facts recorded are so meagre that it is quite impossible to form any valuable surmise about the real cause of death. In some instances spinal anæsthesia was used for operations not usually held to be well adapted to that method. Amputations of the breast, for example, provide one or two of those quoted, and another perhaps more notable instance is that of a boy of 9 years who underwent tonsillectomy under spinal anæsthesia. He was given 150 mg. of neocaine dissolved in 6 c.cm. cerebro-spinal fluid, the injection being made between the second and third lumbar vertebræ. Satisfactory anæsthesia of the entire body resulted, the operation was satisfactorily performed, and the boy returned to bed. About ten minutes later he was put in the sitting position to facilitate expectoration of blood. After about two minutes respiration ceased and resuscitation efforts failed. Here it appears that the fatality will be attributed to the faulty position instituted by

[1] Amer. Jour. Surg., August, 1930, p. 234.

the nurse on a patient still affected by the spinal injection. The authors of the paper, H. Koster and M. Weintrob, have done valuable work in spinal methods, and there is much truth in what they say about the fallacies of statistics tending to show the superior safety of inhalation anæsthesia. We entirely agree with their remark that "the value of any statistical study (regarding anæsthetics) depends less upon the tabulated figures than upon the thoroughness with which all the modifying factors are set forth and discussed." They make no attempt to explain the mechanism of death in those rare cases, some of which are cited, in which a healthy person receiving only a usual dose or merely a spinal puncture dies suddenly. They are to be compared, we suppose, with similar instances in the history of inhalation anæsthesia in which little or even none at all of the anæsthetic has been inhaled when death occurred.

AUTOPATHOGRAPHY.

THE word "autopathography," according to Dorland's Medical Dictionary, connotes a written description of one's own disease. The death of Dr. Leonard Mark has drawn attention to his account of his own sufferings from acromegaly. It is not easy to see how, apart from his skill as a trained observer, the account would add to our knowledge, but his experience probably added to his understanding of the sufferings of other victims of the same disease and the episode prompts inquiry how far subjective experience of pain or illness is helpful or necessary to the physician. To some degree such experience is universal, and a patient's physical pain or discomfort belongs to a world with which we are all familiar. It is difficult, indeed, to conceive that pain in others could be understood by one so constituted as to be incapable of feeling such pain himself; but when we come to the world of mental symptoms we find the conception necessary, for there are not only degrees but qualities of mental pain to which most of us are strangers. A vigorous movement in America and this country towards the advancement of mental hygiene received its stimulus from the experience, as an asylum inmate, of Clifford W. Beers, who after recovery brought to the movement the lessons derived not only from his physical but his mental sufferings during the illness. It is plain from his account that none but an experienced psychiatrist could have realised the quality, or even the existence, of his mental distress, and we can understand why the lack of such realisation in bygone days was associated with harsh treatment of the insane. When, however, we turn to the minor psychoses we find that lack of training has left each of us free, either to despise the neurotic patient as a more or less wilful nuisance, to regard him as in need of nothing more than cajolery or encouragement, or to study him objectively as a problem in which sequences of cause and effect are of scientific and practical interest. Evidence of these reactions can be seen at times in our own columns, and the neurotic patient himself quickly becomes a shrewd judge of the temperamental qualities of his physician. Jung believes that each temperamental type has its own "Weltanschauung," and that only the people whose outlook upon the world is similar can really understand one another. The cheerful and easily adjusted extrovert physician will fail to make contact with the doubting and overscrupulous introvert, and it is an observed fact that some physicians never hear of symptoms that are freely poured into the ears of their temperamental opposites. The symptoms of some of the minor psychoses are so irrational that, in the absence of previous instruction or subjective experience, only close acquaintance with the patient will convince the observer of their importance. Even then it will depend upon his own temperament how much he profits by the experience; he may learn to seek for similar phenomena in other patients or still regard them as curiosities.

Dr. Mark's story could be read with understanding by all medical men and women. An intimate account of neurotic sufferings would be incredible nonsense to some, some would understand it by their subjective experience of lesser troubles of the same quality, but few could appraise it and put it in perspective with the whole subject of the minor psychoses. Thus our understanding of some patients is affected by differences of temperament and inner experience that scarcely touch our attitude to physical suffering. Insanity has been lifted into the objective plane and temperamental differences in medical observers have little influence; improved instruction is tending towards a similar objectification of minor mental disorders, and we look forward to the time when affective reactions will have no influence upon the handling of the neurotic patient.

PUBERTY AND MATURITY.

MANY of the obscurities of sex and of the nomenclature of familiar sexual processes have been cleared up in recent years. The presidential address of Prof. F. A. E. Crew to the Second International Congress for Sex Research, which was held in London from August 3rd–9th, helps a good deal to clarify ideas about the onset of sexual activity, especially in the female. He makes it clear that "puberty" and "maturity" are not the same thing; in any exact analysis they must be distinguished. Puberty is the stage in individual development characterised by the ability to produce functional gametes, and by the desire and capacity to play the appropriate rôle in sexual congress; maturity is the stage characterised by the exhibition of the maximum fertility ratio, in the female by the ability to produce viable offspring and to rear them. Puberty, in short, equips the individual for fruitful mating, maturity for efficient reproduction. It is obvious that human material must necessarily be very unsatisfactory for the exact analysis of these subjects. Prof. Crew as a geneticist is particularly interested in the hereditary factors, and, as he points out, mankind is everywhere so genetically mixed that really pure stocks are not available for the examination of such a simple point as the age at which menstruation begins. A great many data have been collected on the subject; it seems clear on the one hand that environmental conditions of climate and so on have a definite effect, and on the other that the inborn constitution of the individual also has an influence. Thus Bolk, in Holland, found that the average age of the onset of menstruation was about ten months earlier in those whom he classed as blondes by their eye colour than in brunettes. For the investigation of maturity, human material is plainly useless. Prof. Crew, therefore, has undertaken precise observations on colonies of mice kept under controlled environmental condition in his department in Edinburgh, and they bring out very clearly some of the points which he wants to emphasise. In 100 female mice the first œstrus —i.e., puberty—occurred at various times between the twenty-eighth and seventy-sixth days of life. In 20 of the animals it was not followed by mating, and among the 80 in which mating occurred pregnancy

followed in only 24. Of these, seven died and four ate their young soon after birth. In the same mice when they were six months old pregnancy followed 80 to 90 per cent. of matings, and successful pregnancies and rearings were the rule. Pregnancy, therefore, is not only relatively rare when mating occurs immediately on the achievement of puberty, but it is also relatively dangerous. Turning next to the problem whether these events are controlled by genetic factors, Prof. Crew separates the mice into two inbred stocks, one white the other coloured, each of which may be assumed to be approximately pure genetically. In two successive periods of observation he found that puberty arrived earlier in the albinos than in the coloured, the best experiment giving a mean of 39 days for the albinos and 52 days for the coloured. Since œstrus recurs regularly once it has begun, and since the imperfections of pregnancies following the first œstrus are the same whether that occurs early or late, it follows that early and late sexual maturity are constitutional characters, and a preliminary analysis suggests that earliness is dominant to lateness.

The transition from puberty to maturity may then be expressed as the series (1) œstrus without mating, (2) mating without pregnancy, (3) pregnancy without viable offspring, and it seems likely that the successive steps ultimately depend on the development of the full functional activity of the pituitary. There are hardly any data which enable us to judge whether the mouse results may be transferred to man; general experience certainly suggests that they may, and it is at any rate known that very youthful pregnancies are associated with an excessive maternal mortality in both species.

THE ALKALOIDS OF ERGOT.

AN important paper, shedding new light on the alkaloids of ergot, has recently been published by S. Smith and G. M. Timmis.[1] In 1906, G. Barger and F. H. Carr isolated an amorphous but highly active alkaloid, ergotoxine, which was generally believed to be the specific alkaloid of ergot until 1921, when K. Stoll isolated a crystalline substance of slightly different composition which he called ergotamine. Since both of these substances had the same physiological properties, it was believed by some that ergotamine, being crystalline, was the true active principle, but the relation between them has hitherto been very mysterious, more particularly because other workers failed to obtain ergotamine. This failure was explained by Stoll as due to insufficiently protective methods of extraction. Smith and Timmis have now obtained crystalline ergotoxine, crystalline ergotamine, and also the inactive substances ergotinine and ergotaminine in crystalline form, and find all four to be pure and different. While ergotamine readily crystallises from many different solvents, ergotoxine only crystallises from one or two, benzene and its simple homologues and carbon bisulphide. More interesting is the fact that when Smith and Timmis apply either Stoll's own process or Kraft's process to the official ergot of rye, no matter what its country of origin, they always get ergotoxine. But it occurred to them that ergot grows on other grasses besides rye, and they find that when they extract the unofficial ergot of New Zealand tall fescue (festuca) by Kraft's process, they get ergotamine. These results suggest that the method of extraction has little to do with the alkaloid obtained, and that the variety of the ergot has everything.

[1] Jour. Chem. Soc., 1930, clxxx., 1390.

Hence ergotoxine and ergotamine are to be regarded as the active principles of two different kinds of ergot, different in the same way as the official *Strophanthus kombé* is different from the unofficial *S. emini*. Ergotoxine appears to be the true active principle of the official ergot of rye, while ergotamine comes from unofficial ergots.

"GENEVA PLACES."

IT will be remembered that the French delegation to the Naval Conference last spring put forward proposals for "humanising" submarine warfare. Those who retain any interest in such regulation of the game of war will find further food for thought in a paper[1] in which Dr. G. E. de Metz makes some suggestions for the preservation of non-combatants. Dr. de Metz is much impressed by the increasing risks they run from aerial and gas warfare. He therefore advocates the establishment and organisation in peace-time of neutral zones in each country, into which certain classes of non-combatants could be withdrawn in the event of war. He proposes that these areas should be called "lieux de Genève," and that pregnant women, mothers with young children, the aged, cripples, and the sick and wounded should be provided with special non-combatant certificates by the medical authorities, and concentrated in such sanctuaries, which would be neutralised by previous agreements between the belligerents. Each zone would be under the control of a neutral whose duty it would be to see that his area was not used for military purposes, and to prevent persons not furnished with non-combatant cards from using the area. The "sanction" against abuse of any zone would be its declassification as a neutral zone, and the "sanction" against its attack by the enemy would be reprisals against a similar "Geneva place" in the enemy's territory. Dr. de Metz thinks that public opinion may come to demand a gradual extension of the protection afforded by such places to larger and larger classes of non-combatants until the wheel turns full circle, and we may revert to the mediæval conception of war as a matter for professional soldiers or champions only. This is a pleasant change from the realist view of international struggles, and we look forward to the time when a soldier will have to produce his "combatant's card" before being allowed to proceed to the deserted area which has been allotted for the battle.

Dr. W. Norwood East has been appointed one of His Majesty's Commissioner's of Prisons and a Director of Convict Prisons.

THE annual general meeting of the Medical Defence Union will be held at 49, Bedford-square, London, on Thursday, October 2nd, at 4.30 P.M.

[1] Presse Méd., July 26th, p. 1021.

DONATIONS AND BEQUESTS.—Mr. T. W. G. Hewitt, of Weelsby Hall, near Grimsby, left, among other bequests, £20,800 to the Grimsby and District Hospital, including £20,000 for the endowment fund.

Sir William Morris, who has already given £90,000 for the purchase of the Radcliffe observatory site on which additional hospital buildings will be erected in connexion with the Radcliffe Infirmary, has completed the purchase price by an additional gift of £10,000. Sir William Morris's gifts to the infirmary, of which he is president, amount to £150,000.

OPENING OF THE MEDICAL SCHOOLS.

In connexion with the opening of the session at the London Medical Schools, the following arrangements are announced :—

Charing Cross Hospital.—Dr. J. M. H. MacLeod will distribute the prizes on Saturday, Oct. 4th, following tea at 4.30 P.M. The dinner of past and present students will take place on the same day at the Royal Adelaide Gallery Restaurant (Gatti's), opposite the Hospital, at 7.30 for 8 P.M., with Mr. E. B. Waggett in the chair. A special post-graduate course will be held on Oct. 4th and 5th.

Guy's Hospital.—The winter session will begin on Sept. 30th, and the opening address will be given on Tuesday, Oct. 7th, at 3 P.M., in the Physiological Theatre of the Medical School by Lord Moynihan.

King's College Hospital.—This school has now completed a hundred years' work, and an account of this will be given by Dr. Raymond Crawfurd, on Oct. 1st, at the opening ceremony of the winter session, when Dr. G. F. Still will take the chair at 2.15 P.M. The centenary dinner, at which Sir StClair Thomson will preside, will be held at 7 P.M. for 7.30 P.M. on the same evening at the Connaught Rooms, Great Queen-street, W.C.

London Hospital.—The old students' dinner will be held at the Trocadero Restaurant, Shaftesbury-avenue, W., on Thursday, Oct. 16th, at 7.30 P.M. for 8 P.M., with Sir Wilfred Grenfell in the chair. A post-graduate course, like the one arranged last year, will be held at the hospital from Oct. 15th to 18th inclusive.

Middlesex Hospital. — The opening ceremony of the winter session will take place at the Queen's Hall, Langham-place, on Oct. 1st at 3 P.M. Mr. Arthur Greenwood, Minister of Health, will distribute the prizes, and Mr. Eric Pearce Gould will give the introductory address. The annual dinner of past and present students will be held at the Savoy Hotel at 7.30 P.M. on the same day.

Royal Free Hospital.—The inaugural address and prize-giving will be held on Oct. 1st at 3 P.M. The address will be by Miss Maud Chadburn, senior surgeon to the South London Hospital.

St. Bartholomew's Hospital.—The old students' annual dinner will be held in the Great Hall of the Hospital at 7 P.M. on Oct. 1st, with Mr. L. Bathe Rawling in the chair.

St. George's Hospital.—On Oct. 1st, at 3 P.M., Lord Riddell will give an inaugural address at the annual prize distribution in the Board Room. Dr. James Collier will take the chair at a dinner, to be held at 7.15 P.M. for 7.45 P.M., on the same day at the Hyde Park Hotel, Knightsbridge.

St. Mary's Hospital.—The annual dinner of past and present students will be held at the Trocadero Restaurant, at 7 P.M., on Friday, Oct. 3rd. Dr. Reginald Fuller will take the chair. A special post-graduate course will be held from Oct. 3rd to 5th in the Library of the Medical School, beginning at 10.15 A.M. each day, and open to all medical practitioners without fee.

St. Thomas's Hospital.—Dr. R. Muzio Williams will preside at the annual dinner of old students to be held at St. Thomas's House, at 7.30 P.M. for 8 P.M., on Oct. 3rd.

University College Hospital.—The winter session will begin on Oct. 1st. The annual dinner of past and present students will be held at the Hotel Victoria, Northumberland-avenue, W.C., on Friday, Oct. 17th, at 7 P.M. for 7.30 P.M.

Westminster Hospital.—The annual dinner of past and present students will take place at Grosvenor House, Park-lane, W., at 7.30 P.M., on Oct. 1st. Dr. S. E. Dore will preside. Winter session commences Oct. 1st. An inaugural address on "The Medical School, the University, and the State" will be given in the Board Room at the Hospital at 3 P.M. by the Vice-Chancellor of the University of London, Rev. J. Scott Lidgett.

Pharmaceutical Society of Great Britain.—The School of Pharmacy will be opened on Oct. 1st at 3 P.M. The inaugural sessional address will be given by Mr. Arthur W. Hill, F.R.S., the Director of the Royal Botanic Gardens, Kew.

Royal Dental Hospital, School of Dental Surgery.—The prize distribution and conversazione will be held at the Hospital in Leicester-square, at 8 P.M., on Thursday, Oct. 2nd. Sir John Rose Bradford, F.R.S., will preside.

PRESENTATION.—Dr. M. I. Finucane, surgeon and medical officer to the A Division of the Metropolitan Police for 17 years, was presented on Sept. 10th with a silver cigar and cigarette box by the officers and men of the division.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. T. L. Cleave is transferred to the permanent list.

The following appointments are notified: Surg. Comdrs. J. Kirker to *President* and to *Hermes;* J. C. Kelly to *Victory*, for R.N. Barracks; L. S. Goss to *Erebus*, and E. B. Kelley to *Valiant*. Surg. Lt.-Comdr. S. G. Weldon to *Champion*. Surg. Lts. W. C. Sloan to *Kellett*, and F. W. Gayford to *Royal Sovereign*. Surg. Lt. (D.) T. G. A'C. Emberson to *Royal Sovereign*.

ROYAL ARMY MEDICAL CORPS.

ARMY DENTAL CORPS.

Capts. A. Williams and S. A. McCormack to be Majs.

ARMY RESERVE OF OFFICERS.

Capt. J. A. Charles, from Sup. Res. of Off., to be Capt.

ROYAL AIR FORCE.

M. T. O'Reilly is granted a short service commission as a Flying Officer for three years on the active list.

A. W. Comber is granted a temporary commission as a Flight Lt.

Flight Lt. G. T. O'Brien is transferred to the Reserve, Class D (ii).

Dental Branch.—Flight Lt. W. D. Guyler (temp. Capt., General List, Army, Dental Surgeon) is granted a non-permanent commission as a Flight Lt.

INDIAN MEDICAL SERVICE.

Lt.-Col. P. L. O'Neill to be Col.

Lt.-Col. S. M. Hepworth retires.

COLONIAL MEDICAL SERVICES.

Dr. R. Briercliffe, Deputy Director of Health, Palestine, has been promoted to Director of Medical and Sanitary Services, Ceylon.

The following new appointments have been made: Dr. F. O. Driscoll, Medical Officer, Malay States; Dr. R. G. Mayer and Dr. R. Pilot, Medical Officers, Mauritius; Dr. K. Knowles, Medical Officer, Trinidad; Dr. C. Holmes, Dr. C. R. C. Rainsford, and Dr. J. R. C. Spicer, Medical Officers, Uganda; Dr. T. C. Findlay, Medical Officer, Zanzibar.

West African Medical Staff: Dr. J. Barclay and Dr. J. Caplan, Medical Officers.

LIVERPOOL ROYAL INFIRMARY.—During 1929, the annual report shows, this hospital worked at high pressure. The 6752 new in-patients were an increase of 510 over those of the preceding year, and 50 per cent. greater than seven years ago; the average stay was 15·49 days. There were 367 births in the maternity ward, as compared with 297 in 1928. The 36,781 new out-patients were an increase of 3293. There were 3363 operations on in-patients and 3750 on out-patients. In view of a waiting-list exceeding 800, it has been decided to proceed with the building of the second portion of the new nurses' home which will release the site of the present home for additional hospital accommodation. A further £25,000 is needed to complete this second instalment.

RADIUM AT BRADFORD ROYAL INFIRMARY.—Last year 3845 in-patients were treated, an increase of 113. Their average stay was 22·5 days, and the death-rate 7·2 per cent. The average cost per patient was £8 16*s.* 11*d.*, and of each occupied bed £143 6*s.* 8*d.*, figures slightly in excess of the preceding year. There were 4686 new out-patients, an increase of 305. The casualty patients were 7953, of whom 1736 became in-patients. The report of Dr. Chester-Williams on the work of the radium therapy department, which was opened in March, 1929, states that work began with 500 mg. and 12 beds, but upon the delivery of a further 225 mg. in the autumn four more beds were made available. The long waiting-list of urgent cases makes a larger supply of radium a growing necessity. The shortness of time since the department was opened admits of no claims of cure, "but it is satisfactory to note that many patients who had inoperable cancer when admitted are apparently free from disease to-day and are leading normal lives." The total number of patients treated was 243.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCVII.

TREATMENT OF CASES OF ABORTION.

PART II.*

Habitual Abortion.

IN some women miscarriage is the almost invariable termination of pregnancy; in some cases the cause is clear, but in many no satisfactory explanation can be found. Syphilis, chronic renal disease, and toxæmia have long been known as causes of habitual abortion, and as these conditions can be recognised by examination of the blood or urine they can easily be detected or excluded in investigating a case. If syphilis is the cause, treatment for this disease of both parents after miscarriage has occurred will almost certainly prevent others, and even if treatment of a syphilitic woman is undertaken early in her pregnancy there is a good prospect of a living healthy child being born. Chronic renal disease which is bad enough to cause threatened abortion in early pregnancy is so dangerous to the mother's life that no attempt should be made to save the pregnancy, and in cases of toxæmia, unless there is very rapid improvement from treatment, it is better that abortion should occur. Both these conditions occurring in early pregnancy are definite indications for inducing abortion. Retroversion of the uterus is considered by some to be a common cause of abortion, but in my opinion there is no solid foundation for this view; it is very common to find the uterus retroverted early in pregnancy, but in the great majority of these cases no harm is done by the position, and the uterus comes forward at or before the tenth week without disturbance. If it becomes incarcerated there is some fear of miscarriage occurring, but even in these cases the uterus usually comes forward and the pregnancy continues. I have seen more than one miscarriage occur after reposition of a retroverted uterus early in pregnancy, and I am sure that the dangers of miscarriage are greatly increased by these unnecessary manipulations. Over-exertion, shocks, both physical and mental, long tiring motor or train journeys undoubtedly may cause miscarriage; there are some women who can take hard and tiring exercise, including tennis and riding, without disturbing pregnancy, while at the other end of the scale some are unable to get out of bed without running great risk of starting a miscarriage. Between these two extremes every grade is found, so that one woman who has had miscarriages may be able to avoid others simply by doing less, while another, if she is peculiarly susceptible to miscarriages, may have to remain in bed for several months or even during the whole of the pregnancy in order to save it.

In recent years the importance of the internal secretion of the corpus luteum of pregnancy in preventing detachment of the ovum from the uterus has been established by animal experiments, and considerable success has been obtained in the treatment of women who have had frequent miscarriages. If such women are given two or three grains of extract of corpus luteum three times a day during pregnancy a greatly increased proportion of their pregnancies will be saved. Another cause of habitual abortion is faulty or arrested development of the ovum. It is not uncommon in dealing with an abortion as late as 12 or 14 weeks to find no trace of a fœtus, which by that time should be three or four inches in length, and instead, all that is found is an ovum perhaps the size of a hazel-nut, embedded at some point in the decidua. In other cases the pregnancy develops apparently quite normally to the fifth or sixth month, when the movements of the child begin to get less and less vigorous, the uterus does not increase at its normal rate, the heart sounds of the child become more difficult to hear, and finally cannot be heard at all; later the uterus actually becomes smaller and there are evident signs that the child is dead. After death in utero the ovum may be retained for several weeks before labour starts. This type of case suggests gradual failure of the blood-supply of the placental site to increase to meet the requirements of the developing child, which gradually becomes more and more feeble until it dies of starvation. In the first type of case the mother is often a woman who has had several children and is reaching the time of the menopause; in the second she has commonly had one normal child, or perhaps all her pregnancies have ended in the death of the child in utero between the fifth and seventh months. Some of the women of the second type show the clinical signs of thyroid deficiency, and in other cases it may be detected by their low metabolic index. Treatment by thyroid extract should be undertaken in these cases, and already several successful results have followed its administration in women who have had more than one pregnancy that has been terminated by gradual failure of the child in utero.

ADVICE ON THE AVOIDANCE OF ABORTION.

In advising women during pregnancy who are apparently normal with a view to avoiding miscarriages, it is important to remember that some women are unable to lead an ordinary life without bringing on miscarriage, and that in many any tiring or strenuous exercise will upset pregnancy. When a woman is in her first pregnancy it is impossible to know whether she is liable to miscarriage or not, so that the only safe course is to advise a primigravida to take reasonable care and to avoid hard exercise and getting overtired. If she goes through her first pregnancy without any disturbance, she can on another occasion lead an ordinary life with very little risk of doing any harm. If a woman has a miscarriage in her first pregnancy she should certainly take special precautions against over-exertion; games like tennis and golf, and riding should be avoided.

Illegal Abortion.

Often when a doctor is called in to treat a woman who is having or has had an abortion, he may suspect that its cause has not been natural, and he may indeed be virtually certain that attempts have been made to procure illegal abortion. If any intra-uterine manipulation has been done there is always grave risk of infection, so that a doctor may find himself in the position of treating a woman for abortion who may die from the effects of infection introduced before he saw her, and be faced with the responsibility of a coroner's inquest and possibly the suspicion that he himself has procured the abortion.

If a doctor is called in to treat an abortion it is, of course, his duty to save the woman as far as possible from danger, but if he suspects or has reason to know that abortion has been procured by any means, he should certainly call in another doctor in consultation. If this is not done and the patient dies there may be no evidence whatever except his word to disprove an

* Part I. appeared last week.

accusation against him of illegal practice, whereas the support of another doctor may help to save him from disagreeable suspicion. If the patient recovers from an abortion which the doctor virtually knows has been induced the general opinion is that there is no need for him to make a statement to the police; but if the patient should die and he is in any way suspicious of the cause of the abortion, it is his duty to report the matter to the coroner. He should on no account sign the death certificate.

J. P. HEDLEY, F.R.C.S.Eng.,
Obstetric Physician to St. Thomas's Hospital.

SPECIAL ARTICLES

SOME IMPRESSIONS OF THE INTERNATIONAL CONFERENCE ON SILICOSIS,

HELD AT JOHANNESBURG, AUGUST, 1930.

BY A. J. HALL, M.D., F.R.C.P.,
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF SHEFFIELD.

SOUTH AFRICA was the first country to deal systematically with the problem of occupational silicosis. In less than 20 years after gold-mining had begun on the Witwatersrand disability amongst the miners on account of respiratory trouble was so widespread and so serious that measures for prevention and compensation became imperative. The burden was shouldered in the large and broad spirit which is so characteristic of that great and progressive country.

Organisation.

During the last 25 to 30 years the medical organisation has been gradually extended and improved, methods of prevention have been increased and modified, compensation has been adjusted by successive Acts of Parliament. It was therefore natural that Johannesburg, the centre of the gold-mining industry, should be chosen as the place for the holding of the first International Conference on Silicosis. As one of the pilgrims to that Mecca I propose to give a brief account of the conference and its results.

The actual number of delegates was necessarily small, yet in spite of the long journey and the comparatively special nature of the subject under consideration, there were representatives not only from all parts of Europe but also from the United States, Canada, and Australia—a reminder of the many urgent and important points which still await settlement in almost every land.

The work of organisation had been undertaken by the International Labour Office of the League of Nations at Geneva, in close coöperation with the Chamber of Mines at Johannesburg. It is the first international conference as yet held outside Europe. It was opened on August 13th by the Minister of Posts and Telegraphs, who formerly welcomed the delegates to South Africa. From then onwards it met for two sessions almost daily until August 27th when the resolutions which it had adopted were submitted to a public session.

The general plan was as follows. A few weeks before the date of the conference each delegate was supplied with a series of 25 reports. Each of these had been written by a delegate. Whilst those of the visiting delegates dealt with the occurrence in different industries, distribution and mode of handling of the disease in each country respectively, those written by the South African delegates dealt each with one particular aspect of the subject with which the writer was especially concerned and indicated in detail how it was handled in South Africa. These reports, which will appear in the publications of the International Labour Office in due course, formed the basis of the discussions before the conference. The discussions were divided into three groups: (1) preventive, (2) clinical and pathological, and (3) prognosis, compensation, and after-care. Rapporteurs selected from the South African and foreign delegates were appointed for each of these sections, and their reports after full discussion formed the basis of the final resolutions adopted by the Conference.

Work of the Medical Bureau.

Before beginning the discussions, two days were devoted to showing the visiting delegates the methods of working adopted at Johannesburg. The work of the Medical Bureau is carried out under one roof, the Medical Research Institute, a large handsome building standing on a hill at the north side of the city, within easy distance of the station adjoining the hospitals and the medical school. As its name implies, this is primarily a place for medical research of all kinds for which it is fully supplied with well-equipped laboratories. There are spacious animal houses, including stables for 50 horses, used for the preparation of sera of various kinds, with grazing ground alongside.

The pathological laboratories of the Institute deal with the whole of the silicotic work. The clinical and radiological work connected with silicosis is carried out by the Medical Bureau, which has a certain part of the ground floor of the Institute allotted to it for that purpose. This is necessarily a very large organisation. When one takes into account that every white miner has to pass an initial physical examination of fitness before being allowed to apply for work in the industry, and that when at work he must present himself for re-examination at intervals of six months, the actual number of examinations of such individuals amounts to over 30,000 annually. These examinations at the Medical Bureau apply only to the miners of European extraction, and do not include any work in connexion with the much larger number of non-European miners and native labourers, amounting to about 200,000, for whom a separate and more simple form of supervision is provided. Over this work the Bureau exercises a general supervision only. It is unnecessary to go into details of the exact procedure of all examinations at the Medical Bureau. Suffice to say, that it consists of seven whole-time clinicians, together with a radiologist, pathologists, and the requisite clerical staff, photographers, &c.

Each morning is devoted entirely to the examinations of the day. Each candidate, after full details of his history have been taken, is photographed for identity purposes. He is then X rayed and undergoes a full clinical examination by one of the clinicians, particularly as regards respiratory functions. Should there be anything in the least doubtful in this respect he is sent to another clinician for a second independent examination. These examinations are all completed by midday and after lunch the seven clinicians meet

to consider all the cases. The proceedings must be unique amongst medical doings, and are certainly most impressive to a looker-on.

A CLINICAL TEAM.

The clinicians, under the presidency of the chief medical officer, sit around a large circular table in the centre of which is a revolving radiogram stand, with two faces. As each candidate's number is read out by the President from his list an attendant places the corresponding X ray film of that morning on one side of the stand, and the last previously taken film on the other side. At the same time the clinician who has examined the man in the morning reads out briefly his weight, his chest measurements, and any findings in the chest, &c. The radiogram stand is revolved so that all can see the films. Opinions are freely expressed by all before a final decision is reached. In most cases the decision is speedy and unanimous, and indeed the rapidity with which the whole proceedings are carried out is at the outset somewhat bewildering to the observer seeing it for the first time. It soon becomes clear, however, that this rapidity, an essential in dealing with such large numbers, has been attained not by any sacrifice of thoroughness or accuracy, but merely by an excellent organisation on the part of a team working together day by day and knowing exactly what is the share of each.

As in other well-organised undertakings, the bulk of the work has already been done before the sitting of the Bureau, which has only to intervene in any case presenting unusual or obscure phenomena. We lookers-on were satisfied that the Bureau carried out its functions on the whole thoroughly and efficiently, and that there was ample provision for the careful investigation of doubtful cases, which provision was fully made use of. Thus any case which presents difficulties and calls forth real differences of opinion is sent to the ward connected with the Bureau for special further observation.

PATHOLOGICAL MATERIAL.

So much for the clinical side of the work, as regards the pathological side it is carried out in the laboratories of the Institute. Here the material is necessarily also vast in amount and offers an unrivalled field for observation. The routine duties in connexion with compensation cases necessarily take up the greater part of the time of the staff, but a considerable amount of research has been and is being carried out by the pathologists, some of which is of evident promise. When, however, one considers the many important problems connected with this subject which are calling urgently for solution, and the immense amount of material here available for almost any line of research, one cannot help feeling that more time and money could be well spent upon providing active research workers quite free from all routine duties.

Mention must also be made of that important side of the Bureau—namely, the radiographic. For the purely technical details reference may be made to the coming publication by the International Labour Office of the reports dealing with the subject. Actually, for the information of the delegates, a wonderful exhibition of films had been staged. This showed every phase of silicosis with all its modifications, and its combination with tuberculosis in all degrees and forms. Many series showed radiograms taken at regular periodic intervals extending over a number of years, in which the actual development and course of the disease were clearly demonstrable. In some 400 cases of silicosis the Bureau has been able thus to compare together the clinical, radiological, and post-mortem findings, and these composite results have added greatly to our knowledge. Further work on these lines is being carried on.

NATIVE WORKERS.

It seems at first sight a little strange that this close medical supervision of all the miners of European extraction (that is, the white men) should not be equally necessary in the case of the non-European or native workers underground, who relatively number about 20 to 1. For this there is a good explanation. The South African records since the Bureau was established show clearly that Rand miners under existing conditions are practically exempt from recognisable silicosis for the first two or three years of exposure underground. Even up to six or seven years the incidence is only very small. The native worker rarely remains in the mines for more than a few months, perhaps 9 or 12, after which he returns to his kraal and his wife, having earned enough money to set him up. He may never return to the mine, or he may do so for another short period followed by another interval of home life. The result is that comparatively few of the natives are disabled by silicosis, and the stringent medical machinery adopted in the case of long-time European miners is not required.

As a matter of fact, however, there is a considerable medical control over the native workers. Each man undergoes two general physical examinations before being allowed to enter the mines, particular attention being given to the question of pulmonary tuberculosis. Throughout his period of work also, a careful watch is kept for any suspicion of this. The native population is extremely susceptible to tuberculosis, and tuberculosis is gradually being recognised as the factor of greatest importance in the problem of silicosis as a disabling disease. After the visiting delegates had been shown all the details of this great machinery for coping with the effects of silica dust amongst the Rand miners, the actual Conference began its sittings.

The Discussions.

The printed reports referred to above were taken as read. Their discussion gave rise not only to many interesting points, contributed by the delegates from overseas with experience of the disease as it presents itself in industries with working conditions entirely different from those in the South African mines, but it also elicited a great amount of first-hand information from the South African delegates in elaboration of points about which their reports had been necessarily incomplete or difficult to understand.

As was stated above, these discussions were divided into three large divisions :—

1. Preventive Measures.

Here as elsewhere it became evident from the outset that accurate knowledge of almost every detail is still wanting. It was agreed that the disease which under this heading it is sought to prevent is that which arises from the inhalation of free silica (SiO_2), as distinct from silica in chemical combination with other substances.

It becomes noticeable after widely differing periods of exposure to siliceous dust depending apparently upon : (*a*) the amount of dust inhaled ; (*b*) the percentage of silica contained therein ; (*c*) the size-frequency (or fineness) of the particles inhaled ; (*d*) the nature and sort of such other substances (including vapours and gases) as may be inhaled simultaneously, or otherwise ; (*e*) the powers of resistance of the individual concerned ; and (*f*) the presence or absence of a complication by an infective process.

Whilst the importance of each and all these factors was fully recognised, this section of the discussions spent itself chiefly upon the first three. As regards the question of dust measurements, it was felt that our lack of accurate knowledge or of any agreed standard of measurement calls for immediate research, towards which the assistance of the pure physicist should be sought. Until some standard is set up applicable to all industries in which there is exposure to free silica dust, it is impossible to form any accurate estimate of the relative risk of such industries or to formulate the best methods of coping with each in particular. The Conference expressed the strong hope that the settling of such a universal standard of dust measurement might be attempted immediately, and felt that the place best suited for such research would be in the Witwatersrand mines of South Africa. When such a standard means of measuring dust is fixed, a complete world survey of dusty industries of all kinds should follow at an early date.

Much discussion took place as to the relative values of ventilation, general and localised, control by means of water or other solutions, and the use of masks of various kinds. It was pointed out that no single one of these methods can be equally well applied to every form of industry involving exposure to silica dust. Measures which may prove efficacious in the case of a man working at a bench or at a wheel would be quite unfitted for one working underground at the rock face and vice versa. Water, whilst allaying the dust, necessarily increases the humidity, often to an extent which may render the risk of a concomitant bacillary infection more serious. Indeed, the factors involved in all such preventive measures are so many and their interaction is so complex that great caution is necessary before deciding upon the best method in any particular industry. Under any circumstances the importance of general and localised ventilation was urged as one of the best hygienic measures in dusty industries.

Besides these preventive measures dealing with the noxious cause, others of great importance concern the resistance of the worker. In this respect emphasis was laid on the necessity of ensuring that a certain standard of physique should be generally required for all workers entering industries in which the risk of exposure to silica dust is great. This can be met to some extent by an initial medical examination such as already exists in South Africa and in some other places. Further, as experience shows that the onset of silicosis bears a definite relation to length of exposure to dust, periodic medical examinations of those engaged in the industries are essential. Such examinations should be carried out by medical experts who should have at their disposal every facility for conducting the examination. In effect this means that the examinations must be as full and complete as modern medical knowledge can offer.

2. Medical Aspects.

This division of the subject gave rise to prolonged and interesting discussions. On the clinical side general agreement was reached that the earliest recognisable stage of silicosis could be reasonably fixed by the combination of history, clinical signs, and radiographic appearances. The first recognisable stage of silicosis has been called by the South African Medical Bureau "the anteprimary stage," and as such is recognised in their legislature dealing with the subject. The Conference, whilst fully realising how and why this term arose in South Africa, felt that it would be a misfortune to perpetuate it in other countries, and suggested calling the three stages first, second, and third respectively, in order to avoid confusion.

DEFINITION OF THREE STAGES.

The first stage of silicosis corresponds with the South African anteprimary, the second with their primary, the third with their secondary stage. Tuberculosis may occur with silicosis in any stage. Definitions of each stage based upon the history of employment, clinical features, and radiological findings were laid down, and the importance of due consideration to all three of these data before arriving at a diagnosis was insisted upon. Neither the clinical features, nor the radiological findings alone, nor the two combined are in every case sufficiently characteristic to warrant a definite distinction from other pneumonoconioses, although in some cases and in some stages they may be. These definitions will be found in the report of the Conference to be published shortly.

As regards the pathology of the disease interesting experimental results were shown from prolonged dusting with free silica in animals. From these the Conference feel justified in concluding that "silicosis is a pathological condition of the lungs due to inhalation of silicon dioxide which can be produced experimentally in animals." Further experimental work on these lines is urgently called for, and gives hope of fruitful results in many directions.

MICROSCOPIC CHANGES.

So far the investigations suggest that the microscopic pathological changes which may be produced by the prolonged inhalation of silica dust are: (*a*) The development of a dry bronchiolitis characterised by an accumulation of dust-filled phagocytes in or in relation to the terminal bronchioles with possibly some desquamation of their epithelium. (*b*) The accumulation of dust-containing phagocytes about and in the intralymphoid tissue and their transportation through the lymphatics into the tracheobronchial lymph nodes. (N.B.—Up to this point in the process it is considered that the actual disease silicosis is not yet constituted.) (*c*) The gradual development of fibrous tissue within such accumulations of phagocytes and the formation of characteristic nodules of hyaline fibrous tissue. (*d*) Degenerative changes in these foci. (*e*) The hyaline nodules increase in size by extension at their periphery. Coalescence of adjacent nodules takes place and brings about involvement of further areas of the lung. (N.B.—The conditions described under (*c*), (*d*), and (*e*) constitute the disease silicosis.)

MACROSCOPIC CHANGES.

Macroscopically the changes observed in silicosis are:—

(*a*) *In the first stage:* A variable number of palpable pearly-white nodules up to 2 or 3 mm. in diameter on the pleural surface of the lung. On section the cut surface of the lung is studded with pigmented foci, widely scattered, a moderate proportion of which are only just palpable. The tracheo-bronchial lymph nodes are slightly enlarged and deeply pigmented, and may exhibit foci of fibrous induration.

(*b*) *Later stages:* The fibrotic nodules are increased in number, size, and density, and coalescence of these may be found. The portion of the lung between the fibrotic nodules may be emphysematous. The tracheobronchial lymph nodes are still pigmented, may be smaller in size than those seen in the early stages, and are fibrosed.

The above refers to the features produced in silicosis alone, but as is well known the combination of tuberculosis with silicosis may occur at any stage

and modifies the clinical, radiological, and symptomatic picture profoundly. Moreover, there is reason to think that other pulmonary infections may similarly complicate a simple silicotic process and add to its general pathological effect. In this connexion difficulties present themselves. What these exactly are may be made more evident by a short account of the present position in South Africa.

RELATION OF SILICOSIS AND TUBERCLE.

By their existing legislation two distinct groups of cases are compensated: (1) those suffering from silicosis, and (2) those suffering from tuberculosis with silicosis. For this purpose tuberculosis is defined by the Act and the definition makes it clear that the tuberculosis must be recognisable as such. These two broad groups exist and the relative disability which they cause is sufficiently different to call for a difference in the amount of compensation.

With the increasing experience of recent years, however, it has been realised that all the cases coming under Group 1 (Silicosis) are not identical either in the extent of disability, radiological findings, or rate of progress.

For purposes of reference, therefore, the Medical Bureau divides Group 1 (Silicosis) into two subgroups: (A) Simple Silicosis, and (B) Infective Silicosis. The latter show relatively greater disability than their physical signs would lead one to expect; radiologically they show the hanging heart, and, on the whole, they get worse more quickly than cases of Type A—although much less rapid and serious in progress than cases of Group 2 (Tuberculosis with Silicosis). It must be clearly understood that cases both of Subgroup A and Subgroup B are classified for compensation purposes as Group 1—to which they obviously belong.

"INFECTIVE SILICOSIS."

As is stated above, in South Africa this group of cases is at present referred to by the Medical Bureau as silicosis of infective type or "infective silicosis." The term is made use of entirely for scientific purposes and without any commitment as to the nature of the accompanying infection. It does not occur in their legislative terminology. The so-called infective element may be different in different cases, or may be multiple in an individual case. There is some evidence obtained from biological experiments, made from the lungs of a certain number of cases of infective type after death, that the particular infective element may have been a latent focus of pre-existing tubercle, which has not shown recognisable features of tuberculosis during life. There is comparatively little evidence as to the occurrence or distribution of such a twofold type of simple silicosis in other countries and in various dusty industries, and it was felt that on this difficult aspect of pathology the available data are not yet sufficient for any dogmatic statement. The Conference recommended that further scientific research into the ætiology, pathology, and diagnosis of silicosis should be undertaken on an international basis at an early date with especial reference to this point.

As regards pneumonoconioses other than those coming under the definition of silicosis, there was considerable discussion but no very definite conclusions were arrived at, and it was felt that this subject also calls for further investigations.

Reports on the radiographic methods in use in South Africa and Australia are attached as appendices to the reports to which reference may be made for details. In this connexion the Conference thought it desirable to draw up a terminology for the classification of radiograms, which although not presenting appearances corresponding with those accepted as recognisable silicosis yet present linear radiating shadows of greater or less extent beyond normal. In South Africa these have hitherto been classified as radiograms showing varying degrees of fibrosis. It was suggested that it would be better to classify these in terms of shadows—as slight, moderate, or well marked increase of linear radiations, rather than in terms of fibrosis which they may or may not represent.

3. Prognosis and Compensation.

On prognosis the evidence as regards different countries and various industries was somewhat conflicting. On the whole, the hope that early removal from the industry in the first stage of silicosis would necessarily arrest the progress of the disease has not been realised, and it is evident that when a worker has reached the stage of recognisable silicosis he has a definite pathological condition which may or may not progress unfavourably according to various accompanying circumstances, the exact nature of which is obscure. There is also some evidence that a certain proportion of workers suffering from simple silicosis may continue in the industry without any greater increase in progress of the disease than occurs in those leaving it. On these points further information is wanting, and it is possible that fuller knowledge of various industries would show considerable variations in results.

The prognosis in cases of declared tuberculosis with silicosis is always serious. It is worse (*a*) when the tuberculous infection occurs at the outset of silicosis, (*b*) in younger than in older subjects, and (*c*) than in cases of tuberculosis alone.

Compensation and after-care were only dealt with from their medical aspects, and the following conclusions were arrived at: (*a*) Silicosis, complicated or not by tuberculosis, constitutes an occupational disease which may involve reduction of working capacity. (*b*) The determination of disability calls for expert medical examination at which account must be taken of the clinical and functional condition as a whole. (*c*) Seeing the very close and serious connexions between tuberculosis and silicosis, compulsory removal from the industry should be enforced in all cases of declared tuberculosis. (*d*) In those countries where legislation provides for compulsory removal from occupations involving exposure to silica dust of workers affected by silicosis, it should not necessarily be applied to workers who have been in the same industry for a period of not less than 15 years and have reached the age of 45 years.

As regards after-care the provision of sanatoria was approved, and hopes were expressed that further attempts might be made to solve the difficult problem of rehabilitation.

Conclusion.

Although the Conference cannot be said to have made any material addition to pre-existing knowledge, yet it has in many ways served a useful purpose. By collecting together all the available information about dust diseases from all parts of the world, it has shown not only the number but also the position of the gaps in our knowledge of the subject, and so given valuable indications for future lines of research. It has enabled certain standards to be agreed upon, by which future work on this subject may be comparable in whatever country or industry it is carried on. Finally, it has emphasised the urgent necessity for further experimental investigations into almost every aspect of the problem.

THE MEDICAL REGISTER:

UNTRACEABLE PRACTITIONERS IN 1930.

WE are requested by the Registrar of the General Medical Council to publish the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. It is possible that some of the undermentioned practitioners may have communicated with the Council since the list was drawn up. Anyone, wherever resident, who finds his or her name included in this list should communicate immediately with the Registrar, 44, Hallam-street, Portland-place, London, W. 1, otherwise the name will be omitted from the next issue of the Medical Register. Those marked "(S)" should communicate direct with the Registrar of the Scottish Branch Council, 2, Queen-street, Edinburgh.

hern, Albert J. W., M.D., 1927 (Col.).
lexander, William N., L.R.C.P.S., 1905(S).
nderson, Frederick, M.B., 1897(S).
tkinson, Arthur E., M.R.C.S., 1890(E).

arlow, George, M.R.C.S., 1890(E).
arratt, Grantley, M.B., 1912(E).
arry, John C., M.B., 1926(I).
eavis, John D. W., M.R.C.S., 1897(E).
eckingsale, Daniel L., M.D., 1872(E).
ennett, Henry S., M.R.C.S., 1903(E).
hattacharyya, Nirad B., M.B., 1926(Col.).
ielby, Elizabeth, M.D., 1885(E).
iggs, Lesley N. H., M.B., 1901(E).
irch, Henry P., M.R.C.S., 1882(E).
irkinshaw, Frank T., L.M.S.S.A., 1925(E).
landy, Lizzie, L.R.C.P.S., 1903(S).
obo, Rosalvo, L.M.S.S.A., 1927(E).
radley, Harold H., L.R.C.P.S., 1908(S).

apman, William J., M.B., 1927(Col.).
ievreau, Paulin R., M.R.C.S., 1914(E).
ates, Albert P., L.R.C.P.S., 1889(E).
nnor, Thomas F., L.R.C.P.S., 1920(I).
ok, James E. (formerly Cook, J.), M.B., 1908(S).
ombe, Thomas S., M.R.C.S., 1891(E).
rr, Anthony, M.B., 1925(I).
ryn, Herbert A. W., M.R.C.S., 1888(E).
uper, William D., M.B., 1924(S).
rtain, William J. V., L.R.C.P.S., 1914(S).

vies, Charles S., L.R.C.P.S., 1884(S).
vies, Thomas H. R., M.R.C.S., 1922(E).
ck, James C., M.B., 1909(S).
xon, Charles W., M.B., 1914(E).

lwards, Howard S., M.R.C.S., 1926(E).
lwards, Thomas A., M.B., 1927(S).
lery, Ernest E., M.R.C.S., 1898(E).
lis, David, M.R.C.S., 1927(E).
skine, William A., M.B., 1926(S).

ood, Patrick J., L.R.C.P.S., 1917(I).
rster, William A de V., M.B., 1901(I).
sacchia, Nicola, M.D., 1921(For.).

mes, John H. P., M.R.C.S., 1928(E).
rrett, Charles S., M.B., 1926(S).
oghegan, Charles E., L.R.C.S., 1876(I).
bson, Hugh C., M.B., 1904(S).
lmour, John G., M.B., 1920(S).
rdler, George T., L.R.C.P.S., 1881(E).
ace, Alfred H., L.S.A., 1897(E).
ffiths, Gilbert, M.R.C.S., 1876(E).
oot, Antonius A. M., M.R.C.S., 1926(E).

lahan, Thomas D., *O.B.E.*, M.B., 1890(I).
ll, Thomas G., M.B., 1891(E).
rling, Anne T. (Mrs.) M.R.C.S., 1926(E).
rtley, Sydney, *M.C.*, B.M., 1921(E).
arsey, Herbert H., *O.B.E.*, M.B., 1890 (E).
chens, Peverell S., B.M., 1896(E).
nsbeeck, Frank C. S., M.B., 1925(E).
bson, John M., M.D., 1875(E).
dgson, Harold W., *M.C.*, M.R.C.S., 1900(E).
pper, Leonard B., L.R.C.P.S., 1902(S).
rwitz, Charles H. S., M.R.C.S., 1919(E).
ghes, Richard M., L.M.S.S.A., 1891(E).
nt, David M., L.M.S.S.A., 1916(E).
nter, Stewart, M.B., 1928(Col.).

o-Jones, David E., M.R.C.S., 1926(E).
ngworth, Harold T., M.B., 1929(Col.).
rs, John G., M.R.C.S., 1907(E).

Jago, Charles S., M.R.C.S., 1883(E).
Jennings, David R., M.B., 1926(Col).
Johnson, George M., L.R.C.P.S., 1926(S).
Jones, Owen R., L.R.C.P.S., 1915(S).
Jones, William A., L.M.S.S.A., 1922(E).

Kahn, Robert, L.M.S.S.A., 1927(E).
Kapoor, Sobha R., L.R.C.P., 1902(E).
Keating, Henry T., M.D., 1920(Col).
Kidd, James G., M.B., 1925(S).
Kilroe, Sidney H. J., M.B., 1908(E).

Landreth, John F., M.B., 1926(Col).
Leadbetter, James L., M.B., 1896(S).
Lee, George, M.R.C.S., 1927(E).
Litvak, Abramo, M.D., 1920(For).
Livingstone-Learmonth (Mrs.), Agnes M., *C.B.E.*, M.B., 1901(S).
Livingstone-Learmonth, Basil L., M.B., 1896(S).
Lloyd-Evans, Vaughan, M.B., 1907(S).
Low, May A., M.B., 1925(S).
Lownds, Henry A., L.R.C.P.S., 1882(E).

McElwee, Daniel, M.B., 1920(I).
McGregor, Donald F., M.B., 1921(S).
McKenna, Peter, M.B., 1888(I).
MacKenzie, Alexander, M.R.C.S., 1896(E).
McKenzie, James, L.R.C.P.S., 1885(S).
McLaren, William C., L.R.C.P.S., 1927(S).
McLellan, William M. K., M.B., 1926(S).
McLeod, Alexander L., M.B., 1924(S).
McPhun, John F., M.B., 1882(S).
Manasseh, Antonius J., M.R.C.S., 1897(E).
Matthews, Thomas R., M.B., 1898(S).
Maxwell, Raymond, *O.B.E.*, M.B., 1892(S.)
Middlemore (Miss) Merall P., M.B., 1922(E).
Milledge, Geoffrey W., L.R.C.P.S., 1927(S).
Miller, Archibald, M.B., 1928(S).
Millicans, Ebenezer, L.R.C.P.S., 1901(S).
Milligan, William, M.R.C.S., 1868(E).
Mitchell, George A., M.B., 1924(S).
Mitchell, Stanley C., M.B., 1918(I).
Moore Thomas C., L.R.C.S., 1883(I).
Morton, Francis W. W., L.R.C.P.S., 1881(E).
Moyles, Thomas H., L.R.C.P., 1886(I).
Murray, Joseph O., L.R.C.P., 1919(I).
Myburgh, Adrian J., M.B., 1918(S).

Nash, Louisa C., L.R.C.P.S., 1895(S).
Nixon, Arthur P., M.R.C.S., 1898(E).
Norris, Marjorie, M.B., 1921(S).

O'Brien, Francis J., M.B., 1926(S).
O'Brien, Patrick J., M.B., 1892(I).
O'Flaherty, Michael J., M.B., 1919(I).
O'Flynn, James P., M.B., 1914(I).
Ogilvie, Marjory J. A., L.R.C.P.S., 1922(S).
O'Keeffe, Daniel S. A., M.B., 1902(I).
O'Kelly, Cyril J. A., L.R.C.P.S., 1925(I).
O'Kelly, John J., L.R.C.P., 1912(I).
Olaribigbe, Alamu O., L.R.C.P.S., 1915(S).
O'Reilly, David J., L.R.C.P.S., 1901(I).
O'Shea, Michael J., L.R.C.P.S., 1910(S).
Owen, Allan C., M.B., 1902(S).

Paget, Owen F., M.B., 1895(E).
Palmer, Guy F., L.S.A., 1893(E).
Palmer, Septimus, L.K.Q.C.P., 1885(E).
Pandit (Mrs.), Malatibai (formerly Madgavkar, M.), M.R.C.S., 1919(E).
Papadopoulos, Stylianos G., M.R.C.S., 1912(E).
Parbury, Frederic D., M.R.C.S., 1902(E).
Pare, Frank W., M.R.C.S., 1923(E).
Parke, Duke, L.R.C.P., 1868(I).
Parmar, Vithaldas L., M.R.C.S., 1924(E).
Parthasarathy, Parasurama, L.R.C.P., 1921(E).
Pasco, Bernard C. W., M.R.C.S., 1915(E).
Pateman, Ernest A. T., M.R.C.S., 1924(E).
Patterson, Herbert C., L.R.C.P., 1924(I.)
Patterson, Mary E., M.B., 1922(I).
Pauw, Daniel B., M.R.C.S., 1921(E).
Payne, Archibald G., M.R.C.S., 1902(E).
Payne, Florence M., L.S.A., 1902(E).
Payne, Percivall J. G., M.B., 1927(S).
Peacan, Luke, M.R.C.S., 1869(E).
Pemberton, Charles A., M.R.C.S., 1907(E).
Penny, Charles H., M.D., 1878(I).
Penny, Henry J., L.R.C.S., 1878(I).
Penny (Mrs.), Muriel M. (formerly Kenworthy, M. M.), M.R.C.S., 1919(E).
Penton, Richard H., *D.S.O.*, M.R.C.S., 1886(E).
Peoples, Charles J., L.R.C.P., 1927(E).
Peppard, Matthew, M.B., 1926(I).
Perdrau, Joseph A., M.D., 1898(E).
Peringuey, Louis C., M.B., 1927(E).
Pestana, Joseph V., L.A.H., 1910(S).
Peters, Alfred J. A., L.R.C.P.S., 1892(S).
Pfaff, Franz L. F. E., L.S.A., 1894(E).
Phelan, James, M.B., 1921(I).
Phillips, Percy R. O., M.R.C.S., 1916(E).
Phillips, Theodore J., M.B., 1898(E).
Phipps, Michael W., M.R.C.S., 1909(E).
Pierce, Michael J., L.R.C.P., 1908(I).
Pike, John D., M.B., 1924(E).
Pilcher, John W., M.C.P. & S., 1919(Col).
Pile, Charles D., M.B., 1915(I.).
Pilkington, John E., M.R.C.S., 1877(E).
Pincus, Joseph V., M.B., 1926(I).
Pires, George, M.R.C.S., 1891(E).
Plunkett, Bernard, L.R.C.P., 1925(I).
Pocock, Theodore C., M.R.C.S., 1905(E).
Pollock, Alexander M., M.B., 1906(S).
Pollock, Sir Edward J., M.R.C.S., 1863(E).
Poolman, Arthur E., M.R.C.S., 1887(E).
Pope, Charles E., M.R.C.S., 1877(E).
Pope, Herbert F. M., L.R.C.P., 1879(E).
Popert, Alfred W., M.R.C.S., 1886(E).
Portley, Catherine, M.B., 1925(I).
Posthuma, Margaret P., M.B., 1925(E).
Power, John E., M.B., 1914(I).
Prendiville, John, L.R.C.P., 1908(I).
Proctor, John S., L.R.C.P., 1891(I).
Pruitt, Marion C., L.R.C.P., 1915(E).
Purves, Charles W., L.R.C.P., 1884(E).
Purvis, Arthur, L.M.S.S.A., 1926(E).
Purvis, Walter P., M.B., 1927(E).

Quaife, William F., M.B., 1883(S).
Quertier, Ernest C., M.B., 1893(S).
Quinlan, Bernard G., M.B., 1912(I).
Quinlan, Cecil J., M.B., 1919(I).
Quraishi, Mohammad J., L.R.C.P., 1926(E).

Radloff, Theodor, M.B., 1920(I).
Radmore, George R., L.S.A., 1885(E).
Rafferty, William, M.B., 1926(I).
Rankin, William D., M.B., 1905(E).
Rao, Dhanavada S. R., M.B., 1915(E).
Rao, Palhalli R. S., L.R.C.P., 1926(E).
Rastrick, Robert J., M.R.C.S., 1901(E).
Ratnarajah, Hallock, M.R.C.S., 1918(E).
Ray, Tejendra N., M.B., 1920(E).
Rayner, Francis L., M.R.C.S., 1922(E).
Rayner, William H., M.R.C.S., 1904(E).
Raysmith, Frank W., L.R.C.P., 1928(E).
Razzak, Abdalla A., L.R.C.P.S., 1927(S).
Redelinghuys, Johannes, M.R.C.S., 1920(E).
Redhead, Theophilus A., M.B., 1928(E).
Rees, Rice, L.S.A., 1902(E).
Reeves, Thomas C., M.R.C.S., 1911(E).
Reid, John, L.R.C.P., 1891(E).
Rendall, John M., L.R.C.P.S., 1894(S).
Reynolds, Hilda E., M.R.C.S., 1922(E).
Reynolds, Walter E., M.B., 1926(I).
Richards, Hilda W., M.R.C.S., 1919(E).
Richards, William P. E., M.B., 1925(S).
Richardson, Arthur, M.R.C.S., 1875(E).
Riesnik, Jossel, M.B., 1920(S).
Rimmer, Ralph, M.B., 1914(E).
Ritchie, John, M.B., 1910(S).
Rizkalla, Nagib, M.R.C.S., 1927(E).
Robb, Robert McN., M.B., 1906(S).
Roberton, John A. W., M.R.C.S., 1923(E).
Roberts, Ernest, M.R.C.S., 1903(E).
Roberts, Llewelyn, L.R.C.P., 1890(E).
Robertson, Charles W., M.B., 1925(S).
Robertson, Walter J., M.B., 1924(Col).
Robertson, William, M.B., 1901(S).
Robinson, Charles St. H., L.R.C.P. & S., 1896(E).
Rock, William, L.R.C.P.S., 1894(S).
Rodolph, George H., L.M.S.S.A., 1907(E).
Rodrigues, Gabriel F. A., M.R.C.S., 1913(E).
Rogers, Henry, *D.S.O.*, M.B., 1899(I).
Ronayne, Charles O., L.R.C.S., 1863(I).
Rosie, Jessie I., M.B., 1927(S).
Rossiter, Harold T., M.R.C.S., 1908(E).
Rouse, Rolla E., L.S.A., 1883(E).
Rowcroft, George F., *D.S.O.*, M.R.C.S., 1914(E).
Roy, Alexander, M.B., 1924(S).
Rubinstein, Max, M.R.C.S., 1924(E).
Russell, James, C.M., 1877(E).

Russell, Matthew J., L.R.C.P., 1899(I).
Russell, William, *M.C.*, M.B., 1915(I).
Ryan, Daniel, L.K.Q.C.P., 1879(I).
Ryan, James D., L.R.C.S., 1883(I).
Ryan, John, M.D., 1885(I).
Ryan, Louis V., L.A.H., 1925(I).
Ryan, William A., M.B., 1914(I).
Rygate, Arthur M., M.R.C.S., 1897(E).
Rylance, Henry T., L.M.S.S.A., 1928(E).

Sahib, Khan, M.R.C.S., 1917(E).
Sai, Pinthu, M.R.C.S., 1914(E).
Salama, Abd E. Y. M., M.R.C.S., 1926(E).
Salama, Anis, M.R.C.S., 1923(E).
Sammon, William D., L.R.C.P. & S., 1906(I).
Sampson, Basil, *M.C.*, M.B., 1915(E).
Sampson, Bernard M., M.R.C.S., 1903(E).
Sanderson, Arthur F., M.R.C.S., 1909(E).
Saneyoshi (Viscount) Yasuzumi, M.R.C.S., 1883(E).
Sankeralli, Esau J., M.B., 1924(I).
Saul, Victor S., M.R.C.S., 1889(E).
Saunders, Francis H., M.R.C.S., 1881(E).
Saundry, James B., M.R.C.S., 1868(E).
Savage, John J., M.R.C.S., 1917(E).
Sawhney, Mulk R., M.R.C.S., 1908(E).
Sayed, Farid H. A., M.R.C.S., 1914(E).
Schafer, David P. H., M.R.C.S., 1927(E).
Schafer, Noel T. H., M.R.C.S., 1927(E).
Schaffer, Rudolf, M.B., 1924(I).
Schapiroff, Abraham, M.R.C.S., 1905(E).
Scheurer, Jan G., M.R.C.S., 1892(E).
Schultz, Hellmuth H. E., M.R.C.S., 1925(E).
Schultz, Stuart D., M.R.C.S., 1925(E).
Scott, Florence A., L.R.C.P., 1912(I).
Scott, Henry M., L.R.C.S., 1874(I).
Scully, Albert M., M.D., 1880(I).
Scully, Michael, M.B., 1923(I).
Seale, Alfred C., L.R.C.P., 1894(I).
Selim, Hassan H., L.M.S.S.A., 1919(E).
Sellars, Maurice W., M.B., 1920(I).
Sergeant, Cecil F. H., M.B., 1922(E).
Sexton, Joseph P., M.B., 1923(I).
Shaffi, Mian M., L.M.S.S.A., 1917(E).
Shah, Tribhovandes O., M.R.C.S., 1914(E).
Shanahan, Richard, M.B., 1913(I).
Sharpe, Edward L., M.B., 1924(I).
Shaw, Harry C. C., M.R.C.S., 1884(E).
Shaw, Richard G. V., M.R.C.S., 1921(E).
Sheehan, William B. J., M.B., 1928(Col).
Shepherd, Richard Le F., M.B., 1886(S).
Sheridan, John M. M.B., 1915(I).
Shine, Alexander V., L.K.Q.C.P., 1890(I).
Shipsey, Edward, M.D., 1873(I).
Shirwalkar, Raghunath D., M.R.C.S., 1917(E).
Shore, George W., *O.B.E.*, M.D., 1911(E).
Shorland, Edward P., M.R.C.S., 1864(E).
Sibley, Walter K., M.R.C.S., 1886(E).
Silverman, Sam, M.B., 1926(E).
Simpson, James S., M.R.C.S., 1909(E).
Simpson, William B., M.B., 1885(E).
Singh, Jaswant, M.B., 1927(E).
Sloane, Hans H., L.S.A., 1902(E).
Sloggett, Harry P., L.K.Q.C.P., 1887(I).
Sloper, John S., *O.B.E.*, M.R.C.S., 1913(E).
Smith, Alexander, M.B., 1921(S).
Smith, Algernon C. S., *M.C.*, M.R.C.S., 1913(E).
Smith, Hoyland, M.R.C.S., 1906(E).
Smith, John A. C., M.B., 1917(E).
Smith, Lindsay C., L.M.S.S.A., 1914(E).
Smith, Nathan, M.R.C.S., 1924(E).
Smith, William B. A., M.B., 1898(I).
Smyth, James, M.B., 1922(I).
Snodgrass, Kathleen R., M.B., 1921(I).
Sood, Ram P., M.B., 1925(E).
South, Richard E. E., M.R.C.S., 1890(E).
Speed, Henry A., M.R.C.S., 1876(E).
Spiller, Frederic W., L.S.A., 1883(E).
Stack, Mary J., M.B., 1922(I).
Stainer, Edward, M.B., 1897(E).
Stansfield, Frederick J., M.R.C.S., 1902(E).
Steavenson, William H., L.M.S.S.A., 1918(E).
Steggall, Septimus L. J., M.R.C.S., 1892(E).
Stephens, Charles, L.S.A., 1875(S).
Stephens, James B., M.R.C.S., 1903(E).
Stewart, Robert A., M.B., 1901(I).
Sthamer, Eduard F. A., L.R.C.P., 1903(E).
Strange, Arthur, F.R.C.S., 1892(E).
Strelitz, Percy, M.B., 1926(E).
Strong, Evelyn C. N., M.R.C.S., 1926(E).
Subbaramayya, Pappu, M.R.C.S., 1925(E).
Sullivan, Anne, M.B., 1923(I).
Sully, Albert M., M.R.C.S., 1887(E).
Summerhill, Thomas H., M.R.C.S., 1881(E).
Suzor, Jean R., M.B., 1884(E).
Swede, Oscar H., M.B., 1924(E).
Sweetnam, Herbert M., L.R.C.P. & S., 1885(I).
Swettenham, Albert W., L.R.C.P.S., 1897(S).
Swift, William J. C., M.R.C.S., 1874(E).
Sworn, Basil R., M.R.C.S., 1925(E)
Symonds, Henry, M.D., 1888(E).
Synge, Hon. (Mrs.) Ella C. S., L.S.A., 1900(E).

Tackney, James, L.R.C.P., 1927(I).
Tait, John T., M.B., 1922(Col).
Talaat, Abbass H., M.R.C.S., 1921(E).
Tanner, Albert E., L.R.C.P. & S., 1909(E).
Taylor, Alice, L.R.C.P. & S., 1904(I).
Taylor, Edward H. H., M.B., 1928(Col).
Teichelmann, Ebenezer, L.K.Q.C.P., 1887(E).
Telfer, James A. H., M.B., 1911(S).
Temple-Raston, Bertrand, L.M.S.S.A., 1925(E).
Tench, Charles G., M.B., 1893(I).
Te Water, Maria M., M.B., 1925(E).
Tha Richard, R. H. O., L.M.S.S.A., 1915(E).
Thane, Edgar H., M.R.C.S., 1885(E).
Thomas, David, M.R.C.S., 1884(E).
Thomas, Robert A., M.R.C.S., 1906(E).
Thompson, George M., M.D., 1882(E).
Thomson, John A., M.B., 1920(S).
Tighe, John M., L.R.C.P., 1895(I).
Tinsdale, George F. W., M.B., 1925(I).
Tobin, Thomas M., M.B., 1925(I).
Todd, John L., M.R.C.S., 1908(E).
Tothill, Gilbert M., M.R.C.S., 1924(E).
Townroe, Eugene D., M.R.C.S., 1903(E).
Trant, Hope, M.B., 1925(I).
Tratman, Frank, L.R.C.P., 1885(E).
Tremble, John M.B., 1911(E).
Triay, Aberlardo J., M.B., 1883(E).

Usborne, Hermione M., M.B., 1924(E).
Uttley, Kenneth H., M.R.C.S., 1925(E).

Van Buuren, Neville A. A., M.R.C.S., 1925(E).
Van Coller, Frederik A., M.B., 1920(E).
Van der Post, Herman, M.R.C.S., 1925(E).
Van Straubenzee, Clyde H., L.R.C.P. & S., 1894(E).
Vernon, Humphrey W., M.B., 1886(S).
Vernon, John J. D., M.R.C.S., 1885(E).
Vigne, Alfred, M.B., 1890(I).
Viljoen, Jacobus, M.R.C.S., 1925(E).
Vinrace, Edward D., L.S.A., 1883(E).
Vint, Edward T., M.B., 1892(I).
Waddy, John P., L.R.C.P., 1870(I).
Walker, Benjamin, L.S.A., 1887(E).
Wall, John, M.B., 1919(I).
Wallace, James M., M.R.C.S., 1912(E).
Wallace, Patrick J., M.B., 1926(I).
Wallace, Robert F. S., M.R.C.S., 1893(E).
Walley, Thomas B., L.K.Q.C.P., 1878(E).
Walsh, Arthur G., M.B., 1915(I).
Walsh, John V., M.B., 1921(I).
Walsh, Joseph C., M.B., 1917(I).
Walsh, Michael J., M.B., 1913(I).
Walsh, Teresa J., M.B., 1916(I).
Warburton, John R. N., M.R.C.S., 1914(E).
Ward, Oswald E., M.R.C.S., 1900(E).
Warke, Charles L., M.R.C.S., 1886(E).
Warnock, Robert, M.B., 1924(I).
Wassif, Nagib, M.R.C.S., 1927(E).
Watson, Albert D., L.R.C.P., 1884(E).
Watson, Anna, M.B., 1924(I).
Watson, Archibald, L.S.A., 1882(E).
Watts-Slater (Mrs.), Edith W. T., M.B. 1905(E).
Webb, Harry G., L.R.C.P., 1907(E).
Webner, Ralph A., M.B., 1925(I).
Weinberg, Norman, M.B., 1924(E).
Weir, Archibald, M.B., 1928(S).
Welch, Harvey H. V., M.B., 1910(E).
Welply, John J., M.D., 1876(I).
Welsh, Robert C., M.B., 1881(S).
Welton, Frank J., M.B., 1928(E).
Weston, Joseph T., L.R.C.P., 1885(E).
Wetherell, Marmaduke C., M.B., 1902(E).
Wharry, Arthur J., M.R.C.S., 1879(E).
Whelan, John, L.R.C.P., 1900(I).
White, Eva M., M.R.C.S., 1915(E).
White, Patrick W., M.B., 1915(I).
Whyte, John, L.R.C.S., 1885(I).
Will, Ella K., M.R.C.S., 1922(E).
Will, John K., M.D., 1882(E).
Williams, George H., L.R.C.P., 1884(E).
Williams, Horace J., L.R.C.P., 1907(E).
Williams, James A., L.S.A., 1896(E).
Williams, Margaret A., M.R.C.S., 1919(E).
Williams, Reginald F., *M.C.*, B.Chir. 1901(E).
Williams, Ronald M., M.R.C.S., 1927(E).
Willing, Charles E., M.R.C.S., 1928(E).
Wilson, Charles H., L.R.C.P. & S., 1906(I).
Wilson, Harry T. M., *D.S.O.*, M.R.C.S. 1904(E).
Wilson, James, M.D., 1879(E).
Wilson, Mary R., M.B., 1902(S).
Wilson, Thomas, M.R.C.S., 1883(E).
Wilson, Thomas, M.B., 1902(E).
Wintle, Colston, M.R.C.S., 1891(E).
Wise, Walter, L.S.A., 1883(E).
Wise, Walter F., M.R.C.S., 1910(E).
Wiseham, Beryl, M.R.C.S., 1921(E).
Withers, John S., M.R.C.S., 1882(E).
Wolff, Sidney, M.R.C.S., 1919(E).
Wong, Sik To, M.R.C.S., 1919(E).
Wood, Howard J. F., L.M.S.S.A., 1926(E).
Woodforde, William S. R., M.B., 1884(E).
Woodhouse, Sir Tom P., *K.C.M.G. C.B.*, L.S.A., 1880(E).
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BUCHAREST.

(FROM OUR OWN CORRESPONDENT.)

REORGANISATION OF THE MEDICAL PROFESSION.

THE Rumanian Chamber of Deputies, by 133 votes to 7, has passed the new Public Health Bill. The details fill a bulky volume, but the principal provisions may be summarised as follows:—

For the control of medical practice a college of physicians (*Colegiul medicilor*) will be established and only members of this college will be allowed to practise medicine in Rumania. A physician must not take part in any form of commerce, either directly or indirectly, nor must he have any occupation prejudicial to the prestige of the profession. Th college will have one branch in each county and th central board of directors at Bucharest will be const tuted from the presidents of the county council Physicians are forbidden to use any means of attrac ing patients which may lower their profession in th eyes of the public, but the college has the right t require the public prosecutor to take action again anyone who carries on medical practice illegally, an also against anyone who prepares and sells dru without medical prescription. For discipline with the profession, the first tribunal will be the count council of the college. A practitioner may b defended by one of his colleagues, or by a solicito The sittings of the disciplinary council are publ and their decision must be in writing. The cou

of appeal consists of one judge of the Bucharest High Court of Justice, and four doctors appointed by the board of directors of the college. The penalties are as follows: (1) remonstrance; (2) remonstrance and suspension of eligibility for election to the county council for one to three years; (3) temporary suspension of right to practise; (4) removal from the register of the college.

THE PUBLIC MEDICAL SERVICES.

The Act distinguishes five groups of doctors in the public service, according to whether they are concerned with hygiene, healing, laboratory work, administration in cities and parishes, or forensic medicine. Specialists in any branch of medicine must produce evidence of having studied their branch for at least four years after graduation. The law recognises as specialists those who, before its proclamation, were university professors, lecturers, assistants, or senior hospital physicians, or worked as secondary doctors at a special section of a recognised hospital. Private doctors will only be recognised as specialists if they can supply documentary evidence of having worked in their specialty for at least five years.

In the public service the following ranks are established: junior physician, titular physician, chief physician-in-chief, principal physician, inspector-general physician, and consulting physician. As a rule, everyone must begin his public career as a junior physician, and must spend two years in this capacity. If by then he is deemed unworthy of promotion he remains in the same rank for a further year, and if he still does not deserve advancement he must leave the public service for ever. In exceptional cases a man may join the service as titular physician or physician-in-chief if he has served in a private hospital for two years and four years respectively and has especially good qualifications. Advancement is not a certainty in every case, but takes places according to merit. One must, however, spend at least two years as junior and four years as titular physician. The rank of inspector-general is reserved for the most prominent doctors and appointment is subject to the recommendation of a special commission. Their total number cannot exceed 30 in the whole country. If an inspector-general has shown a particularly useful and conscientious activity he receives on retirement the title of *medic consilier sanitar*. The new law considerably raised the grades. The old law knew four grades only, each rise bringing a 15 per cent. rise of the salary. The new law is more liberal and provides five grades, each with 25 per cent. rise, and the total increase of 125 per cent., together with several additional sources of incomes, ensures a very comfortable livelihood. At the age of 60 every physician may be pensioned at the suggestion of the administrative commission. At 62 all must retire without regard to years of service.

DENTISTRY AND OTHER BRANCHES.

The new law definitely settles the troublesome question of dental practice by declaring that dentistry can be carried on by duly qualified doctors or dental technicians who have specialised in stomatology. Those dental technicians who gained their right to practise before 1923 may continue their work without disturbance. Those whose licence was not recognised by the revision in 1924, if over 35 years of age, will have to pass qualifying examinations in December, 1930, while those under 42 will have to attend a regular course, lasting one year, in dental technique and pass the final examination. Only those technicians are justified in applying for admission to the courses who before 1923 had already eight years' practice (two years as apprentices and six years as assistants in laboratories). Those who have passed matriculation examination in a secondary school and attended some foreign high school for dentistry, and obtained a diploma after four years' study, may carry on dental practice in Rumania without further notice. Dental technicians, and also dental surgeons, are not allowed more than one consulting room.

Diathermy, quartz-light, and X ray apparatus may be owned and used by qualified doctors only. Likewise electrolysis and electro-cauterisation should be applied by physicians, and this exclusively medical work must not be done by barbers, masseurs, manicurists, chiropodists, or cosmetic institutes.

The new law puts a stop to brothels and all undertakings connected with the keeping of prostitutes. Henceforth licensed women will have to present themselves twice weekly for medical examination—in towns and cities at the venereal dispensaries, in small towns and villages by the parish doctors.

MENTAL HEALTH IN 1929.

REPORT OF THE BOARD OF CONTROL.

Mental Disorders.

ACCORDING to the sixteenth annual report[1] of the Board of Control there were at the opening of the present year 142,387 notified insane persons under care in England and Wales. This was an increase of only 1307 on the preceding year—about half the average increase—but the Board do not feel that this low figure reflects any real diminution in the incidence of mental disease. It is mainly due to a high death-rate—8·04 per cent.—and also, to some extent, to the increasing shortage of beds, producing a tendency to retain manageable cases in poor-law infirmaries. The margin of accommodation is perilously small, and causes the Board considerable anxiety. They are, however, happy to record that the visiting committees are showing themselves alive to the situation, and that many important extensions were approved during 1929. Brookwood, Glamorgan, Hanwell, and Stafford are building admission hospitals, and Brighton is purchasing a site for one. Banstead, Glamorgan, Long Grove, and Plymouth are building nurses' homes and Barnsley Hall, Bracebridge, Norwich, and Mid-Wales are extending their accommodation.

The total expenditure on the upkeep of county and borough mental hospitals and their patients for the year ending March 31st, 1929, amounted to £7,981,257. The Board no longer publish comparative tables of maintenance rates, for they feel that these are deceptive. They point out that a low maintenance rate is just as likely to spell bad treatment as good management.

HEALTH AND RECOVERY-RATES.

The total number of discharges during the year was 10,497, of which 6997 were discharged as recovered, giving a general recovery-rate for the year of 31·73 per cent., slightly below the average. There were 1216 patients under treatment for tuberculosis at the beginning of 1929; the incidence is highest generally in the northern hospitals, except in Yorkshire, and lowest in the south-eastern counties,

[1] H.M. Stationery Office. Pp. 103. 1*s.* 9*d.*

except Brighton Borough. The figures for the mental hospitals follow closely those for the general population of the areas. During the year the incidence-rate rose 0·5 per cent., and for the first time, the male exceeded the female notifications. The increase seems to have followed the wave of influenza in the spring. In spite of the number of notifications, there were only 1209 tuberculous patients at the end of the year. There was a reduction of about 45 per cent. in cases of the enteric group, and a slight decrease in dysentery. Exhaustive searches are made for the source of these outbreaks but, as the report points out, hospitals not yet provided with laboratory facilities are at a great disadvantage in this respect. There was a considerable increase in the number of cases of erysipelas, principally among women.

Of the total of 1730 patients admitted to licensed houses during the year 43·2 per cent. were voluntary admissions, while 699 voluntary and 610 certified patients were admitted to registered hospitals. In poor-law institutions there were 15,557 certified patients on the first day of the year, but this, of course, is by no means the total of mental cases in these institutions. So far, only one visiting committee has made arrangements for suitable mental patients to be received in a poor-law institution. The Board deprecate the practice of some areas whereby all patients with mental symptoms who need assistance from the rates are sent in the first place to observation wards, which are inadequately fitted and staffed for mental treatment. The report quotes two cases illustrating the dangers of delay in securing effective hospital treatment, and urges that all such cases should be sent direct to a mental hospital.

Mental Deficiency.

It is now possible to secure continuity of treatment and care for the mentally defective by dealing with them as mentally disordered and not as destitute persons. The old confusion is by no means yet cleared away, but the Board hopes to see better things before long. On the subject of adapting poor-law institutions for mental defectives the report makes three comments:—

(1) A few of the better institutions could, they think, be adapted at reasonable cost and might serve as the nuclei of colonies if sufficient land could be acquired; but most of these will be needed for other purposes.

(2) A number of institutions could be adapted for one sex only. The Board recommend that these should be used for the older lower-grade cases who do not appreciate their surroundings, and can only be employed in simple domestic work. This institution should, however, be adequately staffed and should be ancillary to the main colony in the area.

(3) Young, trainable, and employable defectives should only be kept in a poor-law institution as a temporary measure while the colony is being built.

Even if it were possible to use all the beds in poor-law institutions hitherto occupied by defectives, roughly 30,000 cases, mostly young and trainable, would still lack accommodation. Hardly a day passes without an appeal from some local authority for accommodation for an urgent case, and the Board has to reply that no vacancies exist. The number of beds provided by local authorities increased by 1376 during 1929. The report gives a list of authorities who have made some provision, and is able to say that an increasing number of authorities are realising the urgency of the problem, although the provision is still far short of the requirements. There has been an increase in hostel accommodation for mentally defective men and women who are able to be partly self-supporting outside an institution. Hostel treatment provides help and guidance with remunerative daily work, and leads to the possibility of licence or the guardianship of carefully chosen employers.

STERILISATION.

The report discusses the problem of the marriage and sterilisation of defectives. The Board believe in the education of the public as to the nature and needs of defectives who remain at large, and in careful guardianship. They think that many disastrous marriages might be prevented if the local authorities were made guardians and if defectives on licence were visited regularly by trained visitors. They still urge the prohibition of the marriage of defectives under statutory care. While maintaining their view that sterilisation will not solve the problems of mental defect and will do little to alter its incidence, they admit that there are cases in which it might be advantageous and that, if the claims of its advocates are often exaggerated, the condemnation of its opponents rests on an equally unsubstantial foundation.

ASCERTAINMENT.

The increase in ascertainment has continued; at the end of last year 71,439 defectives had been reported to the local authorities, and the ratio per 1000 had risen during the year from 1·69 to 1·8. The returns, however, still vary in different areas from 5·82 to 0·18 per 1000 of the population. The Board confidently expect a large increase in 1930. The Board urge the importance of employing specially trained medical men to make the survey; in these days it is most important to distinguish between those who are unemployed because of their mental condition and those who are capable of work if opportunity offers. For the improvement of ascertainment the Board suggest the following measures:—

(1) Closer coöperation between the various committees of the county and borough councils.

(2) Closer coöperation between the statutory committees for the care of defectives, the managers of Home Office schools and reformatories, the prison authorities, and the remand homes.

(3) Closer coöperation with voluntary and charitable homes and societies.

(4) The appointment of trained officers to carry out the duties of ascertainment and supervision and to develop and supervise guardianship.

(5) The appointment by the local authorities of medical officers with special knowledge and experience of mental defectives.

SUPERVISION.

There were 22,706 cases under statutory supervision at the beginning of this year, and 20,032 under voluntary supervision. This is a gratifying increase, but local authorities still vary extraordinarily in their activities in this direction. The Board urge the appointment of trained officers, the provision of occupational and industrial centres, and of home training, and the full use of carefully selected voluntary visitors in order to render supervision really efficacious.

There are now 161 occupational and industrial centres, which are doing very good work, but the Board think that guardianship as a means of care is not increasing as rapidly as is desirable.

After a review of the results of discharge and licence during the past five years they conclude that discharge has been too often fortuitous instead of dependent on the ability and temperament of the defective and his home circumstances. Most of the successful cases were only discharged after a graduated process of re-education and stabilisation ending in prolonged periods of licence. The growing practice of sending out defectives on long licence seems to be satisfactory, and the Board deprecate any pressure to discharge these cases. It cannot be argued that because defectives have done well under licence they

will do equally well on discharge; they need the forbearance and supervision available on licence, and complete liberty in a competitive labour market often means social disaster.

Varia.

As usual, the details of research work in mental hospitals will be set out in the second part of the report. There has been a welcome increase on previous years, including two reports from mental deficiency institutions. A research chemist has been appointed to the staff of Cardiff City Mental Hospital. Special observations are still being made on cases of encephalitis lethargica. The number under care has fallen from 260 in 1927 to 182 in 1929, but these figures do not represent the whole toll of the disease.

Good progress has been made during the year in the provision of nurses' homes, a policy which the Board regard as an essential part of the modernisation of mental hospitals. Modern nursing demands an educated nurse, and no pensions scheme or any advantage of the kind will make up for unsatisfactory conditions of living. The Board also remark on the high level of qualification which has been demanded of medical officers appointed during the year. There is, however, a great shortage of doctors properly trained in mental deficiency. The Board do not want to add to the already alarming number of special diplomas, but they would like to see courses of post-graduate training available at one or two colonies within easy reach of a teaching hospital.

The report comments on the foreign study tours organised by the Royal Medico-Psychological Association, and expresses a hope that the League of Nations health organisation—which has hitherto ignored the mental hospital service in this respect—will in time recognise the importance of interchange in the sphere of mental disorder.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of five districts which serve in varying degrees as dormitories of London:—

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Willesden U.D. .. (177,973)	16·5	11·7	1·01	1·35	2·4	1·9	61/32	34	4·1
Tottenham U.D. .. (155,000)	16·5	11·9	0·91	1·26	3·4	1·9	63/28	25	1·6
Ford B. .. (112,489)†	15·6	9·7	0·71	1·24	2·0	2·0	49/27	20	4·0
Ealing B. .. (104,000)	14·7	12·4*	0·96	1·44	2·8	2·3	48/22	—	2·0
Hornsey B. . (88,450)	13·8	12·7	0·82	1·62	3·0	1·6	55/30	21	4·1

Stillbirths per 100 live births: Willesden 2·7, Tottenham 3·4, Ford 2·8, Ealing 2·7.

* Standardised rate 11·3.

† After deducting populations of Claybury and West Ham dental hospitals.

Willesden.

Dr. George F. Buchan describes the results of the first six months' work of the Council's clinic for the early diagnosis of cancer up to March 31st, 1930. Of the 52 patients who sought advice, 18 were in need of active treatment for various conditions and 2, including one definite case of cancer, of operative treatment for conditions regarded as forerunners of cancer. The coöperation of the hospitals for treatment has been secured and the press has given wide publicity to the importance of early diagnosis. A coördinated effort is also needed in Willesden to mitigate the results of rheumatic fever, the full benefit of which, however, can only be expected later from the prolongation of working life and the decreased death-rate from heart disease among those attacked. The diphtheria immunisation clinic, established in May, 1927, has come to an end, owing to the lack of parental support. Only two school-children and seven children under 5 years of age attended during 1929. There were 47 notifications of small-pox of the mild type. One death occurred in a man of 63 years from encephalomyelitis, which has aroused medical interest, as this complication has occurred after vaccination, measles, and other diseases. The clinical and pathological details have been published in THE LANCET (1930, i., 566). Nine deaths were attributed to infectious diseases of the nervous system. No deaths from typhoid fever were recorded.

Of the 2714 children born in Willesden, 34·7 per cent. subsequently attended the welfare centres; and the number of births to expectant mothers who attended the antenatal clinic was 564. Under the council's scheme for hospital treatment for children under 5 years, 80 were successfully operated on for tonsils and adenoids and 11 were treated for marasmus with one death. In the endeavour to cope with maternal mortality, the council as from Jan. 1st, 1930, provide sterilised accouchements sets (free, if necessary) and accept responsibility for the fee of a consultant or of an anæsthetist, when needed for a confinement case. Over 4500 mothers attended the three schools for mothers, which had useful programmes of needlework classes and competitions, and lectures, demonstrations, and visits of health interest. Before the war the percentage of verminous school-children discovered at routine inspection was over 20; since the war the figure has come down year by year to 4 in 1929. The scheme for the dental treatment of the elementary school-children is "admittedly incomplete." After an elaborate and complete system of inspection 11,217 out of 15,749 children were found to need treatment, and yet only 2171 received treatment at the dental clinics.

Out of 48 samples of milk examined three were found to contain tubercle bacilli. On two farms tuberculous cows were slaughtered under the order and on the third farm the investigation had negative results.

Tottenham.

Dr. David C. Kirkhope says the outstanding problem is still the housing of poorer families at rents within the compass of their incomes. No subsidised houses were erected during 1929. There were six mild cases of small-pox—the first since 1910. The treasurer's estimate of the population is 168,000. Diphtheria was more prevalent than in 1928—562 cases with 30 deaths (case-fatality 5·3 per cent.). Parents show little disposition to take advantage of immunisation facilities offered. In the endeavour to fill the gap between infancy and school entrance, provision has been made in the next three-years programme for two nursery schools and two nursery

classes. Ionisation continues to give successful results in otorrhœa. Cases are coming up for treatment at an earlier and more amenable stage and "diastolisation" is proving valuable for acute and chronic inflammation in the nose and in thus preventing deafness. An audiometer is to be procured in order to measure accurately the amount of defect and the degree of recovery after treatment. The 32 Tottenham children at the school for the deaf include 19 totally deaf, and it is pointed out that such totally deaf children with normal brain power, whose attendance is regular, should leave school with intelligible speech and useful lip-reading and able to express their thoughts and receive the ideas of others, after starting school life speechless and languageless.

Ilford.

Dr. A. H. G. Burton reports a considerably increased prevalence of diphtheria. There were 305 cases and 16 deaths. The occurrence of 123 cases on the L.C.C. Becontree estate was an illustration of the fact that in these days of carriers good housing does not give immunity. Since November, 1929, 1039 children have been immunised in this neighbourhood. The accommodation at the isolation hospital has been strained and 28 acres of land have been purchased and a layout of the proposed extensions is shown on a plan. The use of antiscarlatinal serum has reduced the duration of stay in hospital. In 1909 the average stay for scarlet fever was 44 days and in 1929 it was 31·3 days. Most cases who receive the serum early can be discharged in three weeks without increased risk of complications or return cases. The school medical service has been extended by the provision of an orthopædic scheme and the appointment of an additional dentist. The open-air school for 100 children began work on Jan. 29th and has already proved its value. The maternity home, opened in 1926, admitted 481 patients and already needs extension. Dr. Burton recommends the provision of a new ward block for difficult emergency cases and a new antenatal clinic also in a separate block. There are six cowsheds on the register. In 1927 Major J. A. Boseley was appointed veterinary inspector for the Milk and Diseases of Animals Acts. During 1925 five cows (two in milk) at the farm attached to a public institution were reported as suspect. Three had advanced tuberculosis and two chronic cough and other signs. All were slaughtered.

Ealing.

Dr. Thomas Orr reports that a scheme is in operation under which every child from birth to school-leaving age will soon receive appropriate treatment for crippling defects. During the year the orthopædic surgeon on his monthly visits to the clinic saw 73 school-children and 87 children under school age. The demand from the parents is so immediate as to necessitate increased accommodation. Operative treatment in hospital, if needed, is provided at Stanmore. The Minister has made Ealing Town Council the supervisory authority under the Midwives Acts and also the authority under the Nursing Homes Registration Act, 1927, thus reversing the action of the Middlesex County Council in refusing to delegate. Dairy premises have been greatly improved and milk in sealed bottles is only allowed to be sold from general stores if it is kept in a cool place. The municipal day nursery has been closed owing to the small number of children seeking admission and the relatively high cost per attendance. The mothers were going out to work and earning 4*s.* to 4*s.* 6*d.* per day, of which they paid 9*d.* for the maintenance of each child at the nursery, leaving the balance of 4*s.* 9*d.* for the average cost of each attendance to be paid out of the rates. It would have been better, Dr. Orr points out, to make a grant to the mother to look after her child at home, but there is no legal power to make such a grant. There is little demand for nursery schools in the borough and the Education Committee admit children between 4 and 5 years of age to infants' departments when this course is desirable. The latest school, now nearing completion, is of the "Derbyshire" open-air type, and two other new schools and a department of similar construction are to follow.

Hornsey.

Dr. R. P. Garrow reports that the new houses were all subsidised—73 houses and 12 flats (private enterprise) and 33 municipal flats. Thirty families including 148 individuals, were moved from overcrowded houses during the year and 33 more were to be moved in April, 1930. The inspectors take steps to prevent recurrence of the overcrowding in the vacated houses. The milk consumed in the borough is estimated at half a pint per head of the population per day. Two roundsmen were fined for selling milk in bottles not filled and closed on registered premises. The municipal midwife attended 136 births and earned £200 16*s.* in fees. The mothers took so much advantage of the maternity and child welfare dental sessions that it was not possible to treat children under 5 years. Dr. Garrow thinks many of the school-children show a lack of robust health, pointing to poor feeding in infancy and childhood. Mr. A. J. Friel treated successfully 70 cases of otorrhœa at his clinic. A local orthopædic clinic is to be established in connexion with the Royal National Orthopædic Hospital and its country branch at Stanmore. A Church of England school, which had been placed on the Board of Education List B, has been entirely reconstructed and extended by the generosity of Mr. David Greig, first freeman of Hornsey (1929) and is now well up to modern requirements.

REPORTS OF SCHOOL MEDICAL OFFICERS

—	No. on roll.	Average attendance.	Routine inspection.	Special exams. and reinspections.	Percentage of defects
Liverpool ..	—	—	42,266	61,029	17·2
Kent	75,736	—	24,268	25,814	15·7
Leicestershire ..	38,019	33,851	10,535	8,907	15·3

Liverpool.

Dr. A. A. Mussen reports advance towards the full development of the service; with the opening during the forthcoming year of two day open-air schools and the orthopædic and other clinics, the only outstanding requirement is the extension of the dental scheme. Additional clinics for the treatment of minor ailments including defective vision and dental work are to be opened at an early date, when the facilities as a whole will be distinctly above those provided elsewhere. For tonsils and adenoids there is a special clinic with 12 beds; hæmorrhage occurred in about 7·9 per cent. of the cases, in a few after discharge from the clinic. That there are so few due to the care given to after-treatment at home printed instructions are sent to the parents about the need of rest for three days, and the nurse impresses upon them the need of carrying out instructions faithfully. It seems that these instructions are unheeded in 30 per cent. of the cases; for instance, a boy played in a billiard match on the night after his discharge and, it is said, blamed the clinic for his defeat. Advice as to food is similarly disregarded. In otorrhœa, treatment by zinc ionisation is giving improved hearing and freedom from recurrence more than other methods. Dental facilities are improving with the appointment of an additional dentist. Orthopædic clinics and hospitals are being adequately provided. Ophthalmic work is thoroughly carried out, including the much needed reinspection of those who fail to wear their glasses, and advice to the parents of myopic children about to leave school. Some of the medical staff have carried out an investigation into the hereditary transmission of Leber disease, hereditary optic atrophy, a kind of research

for which school doctors have special advantages. Records of all cases of defective vision are kept, and from these it was found that all the cases of this disease in Liverpool could be traced back to one blind ancestor; transmission followed Mendelian laws, and was not sex-limited as is commonly thought. The onset was earlier than described by Leber. Accommodation for exceptional children, including stammerers, is more nearly adequate in Liverpool than in most other areas; a fine senior M.D. school has just been added. Squint is treated in pre-school children, a most valuable provision, but otherwise hardly any mention is made of this age-group.

Kent.

Dr. Alfred Greenwood reports a year of smooth working, with an increase in the total number of examinations. There is little mention of extended facilities for treatment or accommodation for exceptional children, and there is still no open-air school belonging to the county authority. The only special school noted is one for 36 mentally defective children at Tonbridge. Dental work shows progress, especially in the coöperation by the parents; in some schools the percentage of acceptances was 100, and fitting tribute is paid to the teachers. The dental trophy awarded to the school at Goodnestone shows the keen interest taken by remote villages. Mr. F. J. Saunders, L.D S., says the increase of parents accepting dental treatment has so occupied the staff that inspections are only half what they were three years ago; the other children only receive dental treatment when it is applied for, usually as a result of toothache. Mr. L. F. Hayes, L.D.S., remarks that the centres are unable to deal with the whole school population, even when working to capacity. He stresses the value of the dental habit; now that almost the whole life of the individual is covered by dental schemes under (1) child welfare centres, (2) school dental centres, (3) dental benefits under the Insurance Acts, there can be little excuse for dental unfitness. The criterion of success in school work is the percentage of children leaving school dentally fit. Dr. Greenwood adds that rather fewer children are having dental treatment for the first time, and more are re-treated, and that this is inevitable unless the dental staff is expanded. The oculist, Dr. J. W. Fox, speaks of the value of covering the "good eye" when the other is squinting or amblyopic. He cites several examples of benefit, in some of which the vision in the weak eye was raised from 6/60 or less up to 6/9 or more. The disadvantages are trivial, and failure is due to not persisting for the necessary minimum of six months; the process should then, he says, be continued during alternate months for another year. Included in the report are the results of some special inquiries by members of the staff. Dr. Dorothy Gallie deals with faults in clothing and footwear. Dr. H. J. Phillips traces some connexion between rheumatism and nose and throat conditions; incidentally he notes that the results of operation were unsatisfactory in 24·4 per cent. of cases. Dr. J. Selfe attributes much debility to incorrect feeding. Dr. F. Wolverson finds evidence that the midday meal brought from home is inadequate; if a school canteen cannot be provided, something should be done to augment the fare by the provision of cocoa or (far better) milk. Dr. W. Lessey describes some types of neuropathic child. Dr. S. A. Tucker's notes on enuresis are of general interest.

Leicestershire.

Dr. J. A. Fairer directs attention to three links in the coördination of infant welfare and school work: (1) Community of staff. (2) Arrangements for transfer of records, especially of the physically defective. (3) Extension of ophthalmic treatment to all necessitous pre-school children. Elsewhere he notes a fourth—namely, infant welfare exhibitions, of which two have been arranged by the superintendent school nurse, and attended by many of the elder school girls to whom she also gives oral instruction. There are in the county no nursery schools, it is true, but the need for them is not such as it is in crowded towns. Dr. Fairer is impressed with the importance of after-care, especially in the case of crippled children whose surgical appliances need constant revision; much is hoped from the formation of local committees associated with the rural community councils. By such means cripples and other defective children of pre-school age would be looked after better. Of the orthopædic work in the county he speaks with appreciation; it includes ascertainment, orthopædic hospitals, clinics and agencies like the Loughborough Cripples' Guild. Massage, electrical treatment, exercises and re-education, ultra-violet radiation and surgical appliances are all provided, the only missing feature is the special P.D. school, the establishment of which in rural areas undoubtedly presents difficulties. Mr. Percy Ashton, L.D.S., has made an investigation of the condition of the teeth in children leaving school; 85·6 per cent. of the children examined had sound permanent teeth, 39 per cent. being naturally sound, and the remainder rendered sound by dental care. The treatment of defective vision is carried out by Dr. Constance Walters, who has made a special inquiry into myopia. It was found that up to five dioptres the incidence of each grade rose steadily with age; above five dioptres this did not hold, probably because the higher degrees of myopia are due to congenital defect. Myopia was not discovered in pre-school children, but diagnosis at this age is difficult. Dr. Walters has also investigated the relation of visual troubles to defective lighting in schools; the percentage of children wearing glasses or showing symptoms of eyestrain was markedly greater in the worse lighted schools, 19·4 against 12·3. Dr. Mary Weston has studied the causes of fatigue in secondary school girls. The hours per week devoted to specific school activities were noted and features of the home life also considered. It was found that there were very wide variations in both groups; hours given to class work and preparation amounted to 31 at some schools for girls of 14, and only 20½ at others. Some girls got 11½ hours sleep at night, some only 7½. Dr. Weston regards concerted action by parents, head teachers, physical training instructors, and doctors as seriously needed.

MENTAL HOSPITAL REPORTS.

The West Sussex County Mental Hospital at Chichester had 877 patients on the books on Dec. 31st last, exactly the same number as the previous year. The recovery-rate was 31·8 per cent. and the death-rate 7·52 per cent. The hospital suffered from influenza, enteric, scarlet fever, and tonsillitis; the medical superintendent remarks that overcrowding must have contributed to these epidemics to some extent. The dietary has been improved. Leave has been granted freely, and on an average 50 patients have had parole within the grounds and 29 more outside. The medical superintendent thinks that there has been a decrease in the public fear of mental hospitals and quotes three interesting cases to show the demand for treatment. The consulting surgeon performed three operations and the consulting rhinologist one. An advanced case of general paralysis was treated with malaria at the Hants County Mental Hospital and showed some physical improvement. The hospital already has an X ray plant, and ultra-violet light is to be provided when the new admission hospital and treatment centre is completed. The visiting commissioner suggests the appointment of an occupations officer. Six nurses and three attendants obtained their R.M.P.A. certificate during the year.

The Staffordshire Mental Hospitals' Board have three hospitals under their care. At Stafford there were 1042 patients resident at the end of last year and the overcrowding has become accentuated. Plans for an admission hospital have been approved, but building has not yet been commenced. The recovery-rate for the year was 33·6 per cent. and the death-rate 8·07 per cent. General paralytics have

been treated by sulfarsenol and biscam; tryparsamide has been abandoned in favour of these preparations as they are much less toxic and give better results. In the laboratory a good deal of work has been done on bacterial toxins, and the presence of hæmoglobin reductases in exotoxins of certain coliform organisms has been established. The metabolism of epilepsy and primary dementia has been investigated biochemically. One ward on each side and the isolation hospital, which is occupied by men, are administered on the "open door" principle. Three men have full parole and two women and 33 men are free within the estate. The general health has been good, except for three cases of erysipelas and 17 of tuberculosis. Women nurses are not employed on the male side. Five attendants passed the final examination of the R.M.P.A. during the year.

At BURNTWOOD there were 940 patients in residence on Dec. 31st last, and consequently considerable overcrowding. It is hoped to build an admission hospital very soon. The recovery-rate was 35 per cent. and the death-rate 9·88 per cent. No less than 78 per cent. of the discharged patients had preliminary periods of trial, many of them with money grants. There was a small outbreak of Flexner dysentery, and the tuberculosis rate is high, as the patients come from a densely populated area. Several operations have been performed, and X ray examinations are carried out by arrangement with a local hospital. Raffia and rug-making have kept a number of patients occupied. A trained laboratory assistant has been appointed, and a number of pathological examinations have been made. About 10 per cent. of the male patients have parole and two wards each side are conducted on the open-door system. The visiting commissioner urges the provision of a clinical room for each ward. Two dental surgeons visit fortnightly. Four attendants gained the R.M.P.A. certificate during the year.

At CHEDDLETON there were 1128 patients at the end of last year. The medical superintendent notes a definite increase in the number of depressed middle-aged male cases admitted—the men whose services are first dispensed with when trade falls off and orders are few. In 95 per cent. of the fatal cases post-mortem examinations were made. The Wassermann reaction has been tested in all new admissions—i.e., 233. Of these, 24 men and 5 women gave a positive result; 20 men and 3 women had general paralysis. Malarial treatment is given to all who show a positive serum. It seems to be the first rigor which is the only effective one, and any spirochætes that survive the first rigor can stand any number of subsequent ones. Of the cases treated by malaria during the last seven years, roughly one-third recovered, one-third were arrested, and one-third were not improved or died. A searching investigation has been made into the possible reasons for the high percentage of tuberculosis in the hospital. The medical superintendent declares that tuberculosis can be abolished from mental hospitals if the public choose; it is all a question of money, for the cases must be properly segregated. There were 31 cases of dysentery in the hospital during the year, with two deaths. The medical superintendent is anxious to have an X ray installation. Parole outside the estate is given to 60 men and 21 women and within the grounds to 30 men and 5 women; three wards on each side are "open door." There are a number of children in the hospital, who are taught with great care; an occupational organiser visits from time to time.

The HERTFORDSHIRE COUNTY MENTAL HOSPITAL at ST. ALBANS had 881 patients at the end of last year. The recovery-rate was 28·6 per cent. and the death-rate 7·19 per cent. Post-mortem examinations were made in 48 out of the 71 fatal cases. A male annexe has been opened for bedridden men and has slightly relieved the overcrowding. A nurses' home was opened in January, and there are plans for providing another 350 beds. The general health was satisfactory except for a few cases of dysentery. Eight patients only are suffering from tuberculosis. General paralysis has been treated with tryparsamide, and two cases have been given malarial inoculation. Dental treatment was given to 58 men and 81 women and an organised effort was begun during the year to tackle the problem of eliminating septic foci. An ear, nose and throat surgeon has been appointed, and visits monthly. Ten operations were performed during the year. There is a physical drill class for men and a handicraft class for women, and the canteen is running successfully. Many routine investigations were carried out in the laboratory, which also does some work for the county mental officer of health. Eight men and eight women have parole beyond the estate, and 26 men within the grounds. The visiting commissioner suggests the desirability of installing X rays, ultra-violet rays, continuous baths, and cinema. No female nurses work on the male side. Six nurses and two attendants obtained their certificates during the year.

The report of the DOWN COUNTY MENTAL HOSPITAL is illustrated with a number of photographs, including an aerial view. There were 774 patients on the books at the end of last year. The recovery-rate was 34·3 per cent. and the death-rate 9·5 per cent. The latter shows a considerable increase on account of influenza. Schemes for supplying electromedical and hydrotherapeutic installation, verandas, and shelters have been approved. Rooms have been adapted for occupational therapy with great success. There was a great deal of paratyphoid, coincident with a widespread epidemic in the neighbourhood, and there was an outbreak of swine fever in the farm at the same time. Four attendants and six nurses obtained the R.M.P.A. certificate during the year.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 6TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 106 (last week 99); scarlet fever, 1411; diphtheria, 1074; enteric fever, 82; pneumonia, 440; puerperal fever, 36; puerperal pyrexia, 92; cerebro-spinal fever, 7; acute poliomyelitis, 24; acute polio-encephalitis, 2; encephalitis lethargica, 10; dysentery, 10; ophthalmia neonatorum, 108. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 9th–10th was as follows: Small-pox, 216 under treatment, 4 under observation (last week 209 and 5 respectively); scarlet fever, 1449; diphtheria, 1671; enteric fever, 31; measles, 135; whooping-cough, 104; puerperal fever, 27 (plus 14 babies); encephalitis lethargica, 119; "other diseases," 35. At St. Margaret's Hospital there were 16 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 10 (1) from measles, 8 (2) from scarlet fever, 9 (1) from whooping-cough, 14 (7) from diphtheria, 50 (11) from diarrhœa and enteritis under two years, and 10 (6) from influenza. The figures in parentheses are those for London itself.

The deaths from enteric fever outside London occurred at Northampton and Cardiff. Liverpool reported three deaths from measles and 2 from diphtheria. Four deaths from diarrhœa were reported from Liverpool, 3 each from Birkenhead and Newcastle-on-Tyne, 2 each from Leicester, Manchester, Middlesbrough, and Swansea.

The number of stillbirths notified during the week was 264 (corresponding to a rate of 38 per 1000 births), including 44 in London.

ENLARGEMENT OF BURTON INFIRMARY.—Extensions to Burton-on-Trent General Infirmary are being made at a cost exceeding £17,000. The work includes an enlargement of the out-patients' department, and the erection of a new X ray department with the necessary accessories, a casualty ward with a new dispensary, a throat and ear department, and improved accommodation for nurses.

CORRESPONDENCE

POSTURE IN HEALTH AND DISEASE.

To the Editor of THE LANCET.

SIR,—May I return to your report [1] of an address on this subject recently given by Miss M. Forrester-Brown to the London Association of the Medical Women's Federation. This report interested me greatly, but in view of the conclusions arrived at by no less a scientist than the late Rudolph Magnus, I am surprised to note that it attributed to Miss Forrester-Brown the following statement: "The position of the head is relatively unimportant in connexion with good posture, for the reflex motor system is at peace provided the eyes are horizontal." Now Magnus, after 14 years' experimentation, arrived at the opposite conclusion, and the details of his work are available to all of us through your columns.[2] It is significant that Sir Charles Sherrington made the "central control" discovery of Magnus the subject of a speech when President of the Royal Society. As the subject of posture in health and disease is of vital importance to every doctor, and as Miss Forrester-Brown has indirectly thrown out a challenge to Magnus and put a shadow of doubt into our minds, may I ask her to give us details of the scientific experimentation which has led her to the very opposite conclusion to that which was reached by Magnus?

I am, Sir, yours faithfully,

Bolton, Sept. 11th, 1930. M. DOUGLAS, M.B.

THE MEDICAL TREATMENT OF CANCER.

To the Editor of THE LANCET.

SIR,—It is really very difficult to express oneself politely, although I do not feel in the least degree acrimonious, when one has to deal with statements such as those of Dr. Todd, for they have their origin in scientific ignorance, verbal inaccuracy, and gross misrepresentation. These are capital offences from an intellectual point of view; and, as with all capital offences, they must be expiated. Moreover, Dr. Todd has advanced no extenuating circumstances to account for his failings: indeed, in his present letter (THE LANCET, Sept. 13th, p. 611) he makes matters worse.

With regard to his reference to the correspondence that has taken place in respect of his claim for priority in the use of lead selenide in the treatment of cancer, you would not have space for the private letters, much as I should like to publish them; I will, therefore, simply quote a short letter that I wrote to you on March 19th, 1927, a week after Dr. Todd's first note (THE LANCET, March 12th, 1927). The letter runs:—

"I have been interested in the brief account by Dr. A. T. Todd of the initial results obtained in some of the cases of malignant disease treated by him with "lead-selenium colloid" (THE LANCET, March 12th, 1927, p. 575). The possibilities of a combination of these elements occurred to me, and doubtless to many others, long ago; and, as a matter of fact, our physical chemists had no difficulty in making an excellent colloid of lead selenide. But what will ultimately prove to be the most useful preparation of lead one can foretell at the present time. Since many preparations of lead will probably be found to affect to a greater or lesser degree malignant neoplasms, what are really needed are comparative studies in regard to a large number of combinations rather than isolated observations of one particular preparation. This is the line our own clinical investigations have taken."

[It was not in respect of this letter that Dr. Todd wrote to me, but in connexion with what occurred in London in 1928, and I shall quote what I then said about Dr. Todd directly.]

In any case it would be puerile for us, who have progressively made and tested some hundreds of preparations of lead colloids to claim any priority beyond that of the use of colloidal lead and colloidal lead compounds in general for the treatment of cancer. However, for the information of Dr. Todd I may say that we commenced the manufacture of lead selenide in October, 1926, and in a private report dated Jan. 10th, 1927, from Prof. Lewis's laboratory for circulation among the staff of the Liverpool Medical Research Organisation, the preface to the description of the preparation of this compound contains the words:—

". . . it was thought by the clinical workers that a compound of this element [selenium] with lead might repay clinical investigation . . . As far as is known a colloidal solution of this compound has not been prepared before, and the details are therefore recorded."

We found, as I have said before, that this preparation is of little value in comparison with other preparations. I give the above quotation to show that in the circumstances I was not ungenerous when I subsequently published at Dr. Todd's request in the *British Medical Journal* (July 7th, 1928, p. 35) the following remark in support of his claim to have worked independently in this connexion:—

". . . the work at Bristol, although based on our work in Liverpool, has been conducted entirely independently . . ."

I should like to inquire in this connexion exactly why in his present letter Dr. Todd says "that the system as described [by Dr. Todd] has been originated here from the work of others and ourselves and owes nothing more to him [W. B. B.]," in view of the fact that he commences his first publication (THE LANCET, March 12th, 1927, p. 575) with the following words:—

"The article published by Prof. Blair Bell on the action of colloidal lead on cancer (THE LANCET, 1925, ii., 793) suggested independent research."

His second communication ("Chemotherapeutic Researches on Cancer," Arrowsmith, 1928) starts in a similar fashion:—

"The promising results of the action of colloidal lead on cancer claimed by Prof. Blair Bell in his article of 1925 determined me to experiment independently, a part of the attraction being a study of the resultant blood changes. We all know the results of his treatment now, but at the time stated proofs were not nearly so complete. The results themselves . . . encouraged the hope that colloidal lead would be of use."

[Of course, our first publication, never mentioned as far as I know by Dr. Todd, appeared in 1922.]

Now, Sir, finding these acknowledgments fatal to his pretentions, Dr. Todd has shifted his ground, or rather turned a complete somersault. He now states that in the treatment of cancer with lead selenide the lead is inert and is merely used by him "as a vehicle for selenium" (!) I confess that such an astounding assertion paralyses my powers of commentation. Is it necessary to add that selenium was extensively tried in the treatment of cancer and found wanting, long before Dr. Todd took it up? Why did Dr. Todd not immediately write dissociating himself from the views expressed in your leading article (THE LANCET, August 23rd, p. 406), where you clearly attribute his results to lead?

[1] THE LANCET, 1930, i., 32.
[2] THE LANCET, 1926, ii., 531 and 585.

The interesting announcement that Dr. Todd intends to give up lead in the treatment of cancer in favour, I suppose, of selenium, already discredited, should be noted by those who imagine that patients are treated in Bristol by the method introduced by us.

I am, Sir, yours faithfully,

Liverpool, Sept. 13th, 1930. W. BLAIR BELL.

RESEARCH DEFENCE SOCIETY.

To the Editor of THE LANCET.

SIR,—I wish I could persuade more members of the medical profession to be subscribers to the Research Defence Society. We do not need any large sum, but if we could get two hundred more annual subscribers of £1, it would make our work easier to carry on. We are the only society that exists to expose the mis-statements of the antivivisection societies and agitators. They preach that all experiments on animals are useless, that no good has come from them to man or beast, and that the experiments are grossly cruel. An uninformed public accept such statements as true, and the only way to get the facts known is by the propaganda of a society such as ours. But this is expensive—and so I ask the help of those who wish it well.

I am, Sir, yours faithfully,

KNUTSFORD,
Chairman, Research Defence Society.

11, Chandos-street, Cavendish-square, London, W., Sept. 16th, 1930.

UNDESIGNATED PASTEURISED MILK.

To the Editor of THE LANCET.

SIR,—Dr. Duncan Forbes's dictum, that the safest liquid milk from the point of view of tuberculosis and sore-throat infections is pasteurised milk, will not be supported elsewhere in the country. Brighton is fortunate in possessing modern pasteurisation equipment. But in other parts of the country there is no doubt that inefficient pasteurisation apparatus still exists. I have recently come across cases of infantile diarrhœa that were reported to be fed on so-called pasteurised milk. Dr. W. G. Savage, in his recent authoritative work, has stressed the dangers of inefficient pasteurisation. This view was upheld by various veterinary surgeons in the discussion at the Royal Society of Medicine (THE LANCET, 1929, ii., 1205), who contended that so-called pasteurisation was making milk dangerous instead of safe for consumption.

I am, Sir, yours faithfully,

Bristol, Sept. 10th, 1930. FRANK BODMAN.

INDUSTRIAL TRAINING FOR THE TUBERCULOUS.—The committee of management of Peamount Sanatorium, Co. Dublin, has established a system of industrial training for tuberculous patients as a step toward the setting-up of a village settlement on lines similar to that at Papworth. The department of Local Government and Public Health of the Irish Free State, has, it is understood, promised its consent to the payment by Boards of Health of certain fees on behalf of patients undergoing training. The Peamount committee states that 31 patients are receiving industrial training with a view to permanent employment by the Peamount Industries. Goods are produced and sold on an economic basis. The ultimate aim is to provide a village settlement for the tuberculous of the Free State, and Dr. P. C. Varrier-Jones, the founder and medical director of Papworth, has undertaken to supervise its development.

MEDICAL NEWS

Post-graduate Courses in Berlin.

Besides the regular programme of post-graduate study a series of special courses are being held in Berlin during the autumn. The subjects include laboratory work (Sept. 29th to Oct. 4th), internal medicine (Oct. 6th to 18th), children's diseases (Sept. 29th to Oct. 11th), the eye (Oct. 1st to 11th), the ear, nose and throat (Oct. 13th to 25th), intrathoracic disease, especially tuberculosis (Oct. 20th to 24th), occupation and illness, with special consideration of assessment of Efficiency (Oct. 27th to Nov. 4th). The courses are held in German, but many of the lecturers speak English. Particulars may be had from the information bureau of the Kaiserin Friedrich-Haus (Berlin, N.W.6, Luisenplatz 2), which offers help in procuring suitable lodgings and arranging attendance at clinics. Further courses will be held in the spring.

A Course in Cardiology.

Dr. C. Laubry will take charge of a course on Diseases of the Heart and Vessels to be held at the Hôpital Broussais, rue Didot, Paris, from Oct. 13th to 25th. Particulars are obtainable from Dr. Mevel at the hospital.

Congress of Orthopædics.

The Société Française d'Orthopédie will hold its twelfth reunion at 9.30 A.M. on Friday, Oct. 10th, at the Faculty of Medicine (Amphithéâtre Vulpian), Paris. The subjects of discussion will be Coxa Vara in Adolescents and Obstetrical Paralyses of the Upper Limb. The Secretary-general is Dr. E. Sorrel, 179, Boulevard Saint-Germain, Paris.

Hygiene in the Tropics.

Lectures and demonstrations for men and women, outside the medical profession, proceeding to the tropics, will be given at the London School of Hygiene and Tropical Medicine by Lieut.-Colonel G. E. F. Stammers, on Oct. 8th, 9th, 10th, 13th, 14th, 15th, 16th, and 17th, from 11 A.M. to 12.30 P.M.

Medical Women's Federation.

The annual conference of the psychological section of this Federation is to be held on Saturday, Oct. 18th, at The Lawn, Lincoln. Dr. Alice Hutchison will speak on Child Guidance in Relation to Juvenile Delinquency, and there will be an informal discussion on The Local Government Act and Mental Treatment Act, and how they affect the Treatment of Mental Disorder.

Instruction for D.P.H.

A three-months' course of lectures and demonstrations on clinical practice and in hospital administration will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, London, N., by Dr. F. H. Thomson, Medical Superintendent, on Mondays and Wednesdays at 4.45 P.M. and alternate Saturdays at 11 A.M., from Oct. 1st. Application should be made to the Medical Officer of Health, London County Council, Public Health Department (Special Hospitals), Victoria Embankment, E.C. 4.

Fellowship of Medicine and Post-Graduate Medical Association.

From Sept. 29th to Oct. 11th, at the Metropolitan Hospital, Kingsland-road, E., there will be an all-day course in medicine, surgery, and the special departments. The subjects of special courses in October are as follows: diseases of ear, nose, and throat (Oct. 6th to Nov. 1st); tropical medicine (Oct. 6th to 25th, all day); gynæcology (Oct. 13th to 24th); diseases of children (Oct. 27th to Nov. 5th); and orthopædics (Oct. 27th to Nov. 5th). There will also be evening courses in preparation for the M.R.C.P. examination (17 lectures on Tuesdays and Fridays), and for the Final F.R.C.S. examination (six demonstrations on Wednesdays). Particulars and syllabuses of all courses may be obtained from the Secretary of the Fellowship at 1, Wimpole-street, London, W.

Ben Ulster Hospital.

The annual report of this eye, ear, and throat hospital at Belfast states that last year 785 in-patients were admitted; new out-patients numbered 6390. The constant growth in the number of patients has necessitated additions and alterations, and the old female ward has been converted into private wards. During the year there were 1022 operations, 29 of them for cataract.

Staffordshire General Infirmary.

The 1549 in-patients last year stayed on an average 15½ days, half a day less than in 1928, and their cost, less an estimated amount for out-patients, was £6 5*s.* 6*d.* Of the 2113 out-patients half were ophthalmic (628) or nose, throat and ears (463) cases. The ordinary income, £8798, was the largest on record.

OBITUARY

MICHAEL BEVERLEY, M.D. Edin.

Dr. Michael Beverley, who died at Overstrand on August 31st, was a magistrate of Norwich for 55 years, and one of the principal medical men in Norfolk. His father was also Michael Beverley and came of an old Norfolk family. The son was born in 1841, and on leaving school was apprenticed to Mr. W. B. Francis, a local surgeon. At the age of 16 he was already visiting the sick and vaccinating babies. At the Norfolk and Norwich Hospital he learnt the art of notetaking under Mr. Firth and Dr. Eade, and with this experience behind him entered King's College Hospital, where he dressed for Sir William Ferguson. Proceeding to Edinburgh he worked under Syme and Simpson, and graduated before the legal age of 21. This allowed him to spend a year in Paris, where he followed the clinics of Trousseau, Vélaton, Roger, and Giraldè's, and lived in the narrow 4d rue de Seine. These were the palmy days of the 1st Empire, and Beverley found them enlivening and picturesque. But at the end of the year the post of house surgeon at the Norfolk and Norwich Hospital fell vacant, and he secured the appointment. Thus, in 1864, he began an association which remained almost unbroken till his retirement in 1913. After more than six years as resident medical officer, and (as he said) "practically lady superintendent" as well, he went to the Rotunda to rub up his knowledge of midwifery, and from Dublin back to Edinburgh with an introduction to Lister. He returned an enthusiastic convert and proceeded to carry out Listerian principles at Norwich. In practice he entered partnership with William Cadge, a notable figure in British surgery, and the association was a happy one. During the long years of practice which followed he won a reputation not only as an able surgeon, but as a generous and valuable friend of his hospital, his colleagues, and his patients. He was, moreover, an enthusiast for his county. He was more or less the "discoverer" of Overstrand as a holiday resort, and he had a house there for his family 40 or 50 years ago. In 1920 he moved from Scole to Overstrand and lived there permanently thenceforward. The Brundall Gardens, which were laid out under his supervision, testify to his success in landscape gardening which was a lifelong hobby.

Dr. Beverley married Marion, daughter of John Colbatch, J.P., but was left a widower in 1917. One of his sons, Michael, was killed in the war. One son survives, and four daughters.

HUGH SMITH, M.D. Lond., F.R.C.S. Eng.

THE death of Dr. Hugh Smith on July 2nd is deeply regretted in South Africa and comes as a serious loss to the teaching staff of the medical faculty of Cape Town. Born in London in 1863, the son of Hugh Smith, of Darvel, in Ayrshire, he was educated at the City of London School and the London Hospital. He graduated in 1886 and became M.D. and F.R.C.S. two years later, having meanwhile served as house physician to Hughlings Jackson and as resident accoucheur at the London. From 1891 onwards he practised in Leghgate, but in 1900 went to join the late Sir Alfred Jamson in partnership at Cape Town, where he rapidly established a reputation for accurate diagnosis. His opinion was frequently sought by fellow practitioners, and these demands became so exacting that eventually he gave up general practice and undertook consultant work alone. He is said to have been the first consultant in South Africa, and at first his position was understood with difficulty by his patients. But his position was soon assured by the quality of his work. To charm of manner he united a quiet and forceful personality. General Botha, a notoriously difficult patient, said of him: "That Dr. Smith is different from you doctors. He's not the sort of man you can quarrel with." He was an active member of the British Medical Association for many years, and in 1914 he was elected president of the Western Province branch; when the Medical Association of South Africa was established he gave it whole-hearted support, although he had been in favour of retaining the parent association. He was honorary visiting physician to the New Somerset Hospital from 1902 to 1919, and on his retirement from that post became a member of the consulting staff; during the late war he held the position of consultant to the military hospitals at Wynberg and Maitland. Until the time of his death he was a member of the Faculty of Medicine of Cape Town University and lecturer on dermatology. In 1921 he was elected to the presidency of the Seventeenth South African Medical Congress which met that year in Cape Town. His energy, kindliness, and wide human sympathies were responsible for the affection and esteem felt by patients and colleagues alike.

THOMAS WALLACE, M.D.R.U.I.

Dr. Thomas Wallace was an important figure in the city of Cardiff for half a century, and his death on Sept. 5th ends a long life of useful work for the city. He was born in County Antrim in 1849, the son of Thomas Wallace, and was educated at Coleraine and at Queen's College, Belfast. Graduating there in 1870, he became M.R.C.S. Eng. two years later. From '77 to '82 he was medical officer to out-patients in the Cardiff Infirmary, then he joined the staff as surgeon, and in 1905 became consulting surgeon. Meanwhile he had built up a large practice and was widely known as medical officer of friendly societies, surgeon to the Bute Docks Police, and a referee under the Workmen's Compensation Act. At the same time he threw his energy and influence into many kinds of social, educational, and benevolent work, especially for the Royal Infirmary. A Justice of the Peace for Cardiff since 1892, he was appointed a Justice for the County of Glamorgan in 1903. During the late war he served on the staff of the 3rd Western General Hospital, with the rank of Lieut.-Colonel, and for many years he was closely associated with the activities of the Order of St. John of Jerusalem. In 1928 he was elected Grand Superintendent of the Provincial Grand Chapter of Royal Arch Masonry in South Wales.

"It can truly be said of Dr. Wallace," writes a colleague, "that he was a striking personality, one in whom confidence was inspired and retained with complete justification, for he rang true every time. He was kindly disposed and of a lovable nature, always ready and willing to find out and listen to the other man's point of view. He was a man of strong convictions and never hesitated to declare them when it was necessary to do so, but their declaration was always tempered with kindliness, and this probably explains why he had such a wide circle of friends and so few, if any, enemies. Those of us

who knew him and worked with him pay tribute to his sterling worth. The nation and the profession can do with more men of his strong rugged personality."

Dr. Wallace married Margaret, the daughter of the late Dr. C. R. Vachell. She died in 1916. He was long assisted in practice by his nephew, Dr. Tom Wallace, and he leaves a family of five married daughters and two sons, one of whom is Dr. John Wallace, of the Ministry of Pensions.

ROWAN McCOMBE, F.R.C.S.Irel., D.P.H.

Dr. McCombe, who died at Margate on Sept. 11th, in his 60th year, was the first whole-time medical officer of health for that borough. He was a student of the Meath Hospital, Dublin, qualifying in 1892 and taking the Irish surgical fellowship and the diploma of public health some ten years later. He settled in Margate about 25 years ago, and became surgeon to the Cottage Hospital and hon. medical officer to the Cripples' Holiday Home. On the death, in 1914, of the part-time medical officer of health, Dr. Bertram Thornton, the local authority decided to make the position a full-time one, and appointed Dr. McCombe medical officer of health and school medical officer. Among his duties he was medical adviser to the child welfare centre and he was also police surgeon to the borough. Dr. McCombe leaves a widow and two children.

THE LATE DR. LEONARD MARK.

Sir D'Arcy Power writes: "Few persons have described a disease from which they have themselves suffered. The outstanding instances are Montaigne and Pepys as laymen; Thomas Sydenham and Leonard Mark as doctors. Montaigne and Pepys only give details incidentally and as they affected their general life. Sydenham and Mark made more careful studies and yet each in a wholly different manner. Sydenham in his 'Tractatus de Podagra' used his own experience as a basis for a description which soon became classical and, as gout has now become rare, is unsurpassable. But he went into no minute details and dealt rather in generalities, using his personal knowledge to illustrate the thesis. Leonard Mark, on the other hand, in his book on 'Acromegaly' published in 1912 and in the 'Apologia' which appeared 15 years later, aimed at giving a minute and complete account of the disease as it occurred in a single case—viz., in himself. He traces it from the insidious beginning, and by means of photographs shows the physical changes which it caused in his own person. Pursuing his object he records the changes which took place in his eyes, in his skull, and in his brain, obtaining written opinions from those amongst his many friends who were masters in their own branches of knowledge. Finally, to complete the record he left directions that his skull and brain should be examined after death by a competent pathologist. Not content with a study of the physical side he placed on record the mental states involved which he alone could treat adequately. The headaches; the lethargy; the subjective noises and the varying feelings of depression. Yet all is done in a scientific spirit and without undue introspection or any self-pity and in this lies the value of the record. A notable example of the mens sana in corpore insano, and so an exception to the general rule. Whether it were worth while to have done it is another matter. Occasionally 'yes' when the patient can take so detached a view of his malady, but an example not to be copied too frequently, especially in this age of sentiment."

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUAT MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Sept. 22nd, to SATURDAY, Sept. 27th.—WES MINSTER HOSPITAL, S.W. Post-graduate course i medicine and surgery and the special department occupying each day from 10.30 A.M. to 5.30 P.M., wit lectures and demonstrations. Men only.—Furth particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Sept. 22nd.—2.30 to 5 P.M.: Medical, Surgical, an Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nos and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Ey Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M. Medical, Surgical, Throat, and Ear Clinics. Operation
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.3 to 5 P.M.: Medical, Surgical, and Children's Disease Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE Hammersmith, W.
MONDAY, Sept. 22nd.—10 A.M. to 1 P.M., Surgical Ward Genito-Urinary Operations, Skin Department. 2 P.M Operations, Surgical Wards, Medical, Surgical, Ey and Gynæcological Out-patients.
TUESDAY.—10 A.M. to 1 P.M., Medical Wards, Clinic Demonstration (Surgical Dental Department). 2 P.M Operations, Medical, Surgical, and Throat Out-patient
WEDNESDAY.—10 A.M. to 1 P.M., Medical and Surgic Wards, Children's Medical Out-patients. 2 P.M Gynæcological and General Operations, Medica Surgical and Eye Out-patients.
THURSDAY.—10 A.M. to 1 P.M., Neurological Out-patient Demonstration of Fractures. 2 P.M., Operation Medical, Surgical, and Genito-Urinary Out-patient
FRIDAY.—10 A.M. to 1 P.M., Medical Wards, Skin Depar ment, Dental Department, Clinical Demonstratio (Medical). 2 P.M., Operations, Medical, Surgical an Throat Out-patients.
SATURDAY.—10 A.M. to 1 P.M., Throat Operations, Bacteri Therapy Department, Medical Wards, Children Medical and Surgical Out-patients.

CENTRAL LONDON THROAT, NOSE, AND EAR HOS PITAL, Gray's Inn-road, W.C.
FRIDAY, Sept. 26th.—4 P.M.: Mr. J. D. McLaggan Tuberculosis of the Larynx.

Appointments

LEWIS, IVOR, M.B. Lond., D.P.H., Medical Officer of Health f Plymouth and Superintendent of the City Hospital.
TOLEMAN, R. J., M.B. Lond., Assistant Medical Officer Health and School Medical Officer for Bristol.
Certifying Surgeons under the Factory and Workshop Acts COLLINS, E. A., L.R.C.P. Lond., M.R.C.S. (Saxmundham) CHISHOLM, J. P., M.B., Ch.B. Glasg. (Somercotes, Lincoln) and JOHNS, L. P., L.R.C.P. Lond., M.R.C.S., St. Blaze (Cornwall).

Births, Marriages, and Deaths

BIRTHS.

GORDON.—On Sept. 11th, at Welbeck-street, the wife Dr. Hugh Gordon, of a son.
WRIGHT.—On August 25th, 1930, to Miriam, wife of Samso Wright, M.D.—a daughter.

MARRIAGES.

CURNOCK—OWEN.—On Sept. 6th, at Epping, J. Edgley Curnoc M.R.C.S., L.R.C.P., L.D.S., to Muriel Owen.
FITZGERALD—SLATER.—On Sept. 10th, at Dunedin, N.Z H. Walden Fitzgerald, F.R.C.S., to Alfreda Hurwort only daughter of Mr. and Mrs. Alfred Slater, Wallesey.

DEATHS.

ARTHUR.—On Sept. 9th, at Blackhall Wood, Carlisle, Lieut.-Co A. S. Arthur, O.B.E., R.A.M.C., Retired Pay.
ASLETT.—On Sept. 6th, at Tiverton, George Stratton Aslet M.B., aged 70.
CLARKE, WILLIAM FREDERICK, M.D. Lond., who practised Fulham, London, and later in Toronto, Canada, died Berkeley, California, on Sept. 12th, 1930.
KELLGREN.—On Sept. 11th, at Eccleston-square, Victoria, S.W Dr. Ernest Gregor Kellgren.
MCCOMBE.—On Sept. 11th, at Heronden, Margate, Rowa McCombe, F.R.C.S.I., D.P.H.Camb., Medical Officer Health for Margate, aged 59 years.
SAWYER.—On Sept. 10th, suddenly, at Horton-lane, Bradfor Henry Sawyer, M.R.C.S.
SKEEN.—On Sept. 6th, at Kilmore Quay, Wexford, suddenly Dr. George Skeen, of Colne, Lancashire, aged 60.
WRIGHT.—On Sept. 12th, at his residence, Carleton-road, N Dr. Holland Hodgson Wright, aged 77.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE HEALTH OF BATOUM.

BATOUM, which was ceded by Turkey to Russia in 878 by the Berlin treaty-makers, is a town of some 2,000 inhabitants in a populous neighbourhood. he traveller, who reaches the town from the west y cruising along the north coast of Asia Minor, once e has passed Cape Sinope, enters a new and a milder limate. The sky is blue, the weather is warm, the egetation semi-tropical; and though the view is amed by the snow-clad peaks of the Caucasus, only 0 miles away, the actual temperature throughout he year varies only between 104° and 40°F. A rain- all of 100 inches gives plenty of water: the fertile oil produces tea, tobacco, cotton and maize, besides any fruits. The other chief exports are manganese res, light oil conducted from Baku along a 600-mile ipe line, and heavy oil. But there is a seamy side o the picture as we learn [1] from Dr. Berge, a surgeon- eutenant-commander in the French Navy, who has ade eight visits to the port. Batoum is a semi- astern town of deplorable sanitary conditions, with ttle to spend on sanitation. The diseases causing nxiety are typhoid and typhus fevers, undulant fever, alaria, tubercle, dysentery, trachoma, small-pox, nd venereal diseases, but an efficient quarantine ervice protects it from plague and cholera. There a medical department to deal with threatening iseases, and some 100 physicians, a few with European aining, but most of them educated at Moscow or iflis. Those in charge of the industrially assured e paid £15 a month with liberty to engage in private actice. There are four public dispensaries in atoum, for venereal diseases, tubercle, malaria, and ild welfare, while travelling groups of doctors visit ie neighbouring villages to advise on the prevention cure of illnesses. The civil hospital of 300 beds is ell equipped; the military hospital even better. revention of syphilis is attempted by a free prophy- ctic station, in charge of a doctor, and always open, it there is not enough propaganda to popularise it. Tolerated houses" have all been closed, as they are garded as a denial of individual liberty. Drugs me mostly from Germany, some from Moscow, but ere are four laboratories in Georgia, which make rums and vaccines. Dr. Berge's last voyage nfirmed his impression of rising cost of living, creasing poverty, and threatening famine.

OOKED FOOD FOR ARMIES IN THE FIELD.

STARVING soldiers have been inspired to victory 7 great generals; we think of Clive at Arcot, of onewall Jackson in the Shenandoah Valley. But ore even results may be expected if the troops t hot meals regularly, and a recent article,[2] by ajor C. T. Beckett, tells how this is to be managed the British Army. With mechanisation, petrol s become the general service fuel of future wars d will be used for cooking. It will be burned in an l-stove, with a hydra burner (a "combustor," e are told, of the Primus family). The stoves will be four types: a single burner, which will cook for men and will be carried in every armoured fighting hicle; a two-burner stove (pack transport) which ill cook for 50 men (at brigade headquarters and the e); and two varieties of the general service pattern hich will cook for 250—either stationary, for lines of mmunication, or mobile, on a trailer, for the fighting oops. The three larger patterns have an oven which ill roast for half their men.

It was asked whether the cooking need be completed in e trailers. Haybox cooking was considered, but it was ought that hay might be scarce in a modern war, and e problem was studied afresh. For every soldier it is intended that two hot meals of two pints each shall be cooked and distributed daily. A quarter of them will be cooked in pairs of one-gallon stainless steel containers, for men on detachment, and three-quarters in six-gallon containers for the main groups. The food will be brought to the boil in the containers on the oil-stove and at once removed and slipped into boxes of three-ply wood, faced with metal and insulated with kapok, in which cooking will go on until the temperature falls to 140°—i.e., in 10 hours for the smaller, in 17 hours for the larger containers. Thus the usefulness of the kitchen is at least doubled, and it is expected that the soldier will always get his two meals a day well cooked and reasonably hot.

[1] Arch. de méd. navales, 1930, i., 119.
[2] Jour. Roy. United Ser. Inst., May, 1930, p. 360.

PIONEERS OF PUBLIC HEALTH.

A GOOD many people must have looked at the names inscribed on the new School of Hygiene and Tropical Medicine in Gower-street, and wondered who some of them were; hardly anyone is informed enough to know about them all. Lister, Pasteur, and Jenner are, perhaps, familiar enough, but who are Frank and Lind and Shattuck, and, nearer home, Pringle and Farr? And in these days of spectacular parasitology it is particularly well to be reminded of the great apostles of drains and soap and statistics. We judge, therefore, that Mr. Walker has done a useful service in putting together very readable short biographies [1] (with portraits) of the heroes celebrated on the building; the book will serve its purpose admirably.

A RADIO-ACTIVE COMPRESS.

"Radiumchema" is the trade-mark of radio-active compresses manufactured in the State-controlled chemical works of Kolin with radium derived from the mines at St. Joachimstal, Czecho-Slovakia. The compress which we have received (from Hedges House, 153, Regent-street, London, W.1) measures 6 by 8 in. and is certified by the Curie Laboratories to contain 0·1 mg. of radium. It is constructed so as to conform to the part of the body to which it is applied; it can be taken out of its flannel cover and washed with warm water or disinfectant; and it is kept in place on the affected area by means of a simple bandage. The materials of which it is composed have been assembled under the control of the Radiological Institute of Prague and the Technical Academy in Vienna. The compress is recommended for the relief of pain in many regions of the body as well as for a variety of other conditions. Testimonials from institutes in Central Europe confirm its value in relieving pain; Dr. Markl of the Prague Institute regards the results observed as due to activation of the tissues, to promotion of metabolism by increased lymph flow, and to direct sedative effect on the nerves.

THE USE OF THE MICROSCOPE.

A STRAIGHTFORWARD practical account of microscopic technique with a minimum of theory has been compiled by Mr. J. Belling [2] to help those who use the microscope to get the best out of their instrument. The section on photography is brief, and in the chapter on drawing nothing is said about drawing an image projected on to paper—for many purposes a much more convenient plan than the Abbé camera. There is a full bibliography, and it is pleasant to notice the importance which is attached to the work of the English pioneers.

[1] Pioneers of Public Health. By M. E. M. Walker. Edinburgh: Oliver and Boyd. 1930. Pp. 270. 12*s.* 6*d.*
[2] The Use of the Microscope. A handbook for routine and research work. By J. Belling, Cytologist at the Carnegie Institute, Washington. London: McGraw-Hill Publishing Co. 1930. Pp. 315. 20*s.*

STANDARDISED COD-LIVER OIL AND MALT.

THE Ministry of Agriculture and Fisheries inform us that every jar of "malt and oil" sold under their National Mark Scheme is legally guaranteed to conform with the following standards:—

Purity: Absolute freedom from adulteration.

Protein Content: Not less than 5 per cent. by weight of soluble protein.

Carbohydrate Content: Specific gravity of the malt extract of not less than 1·4 ensures a high proportion of carbohydrates, which are present in a readily assimilable form.

Cod-liver Oil Content: 15 per cent. by volume of the total mixture, with the permissible variation of 1 per cent. above or below this figure as a margin of error.

To attain National Mark standard malt extract must have a diastatic activity of not less than 25 Lintner. This prescription in the National Mark Scheme of a minimum standard of diastatic activity is said to be an innovation in the trade. Apart from other advantages which may be claimed for diastatic activity, its presence is held to afford a reliable indication that due care has been exercised to ensure that the accessory food factors of malt extract have not been destroyed or seriously reduced by the manufacturing process.

The present retail prices of National Mark "malt and oil" are 1*s.* 3*d.* per 1 lb. jar, and 2*s.* 4*d.* per 2 lb. jar.

Vacancies

For further information refer to the advertisement columns.

Alderley Edge, Ancoats Hospital, Convalescent Home, Great Warford.—Hon. Visiting Physician. £50.
Archway Hospital, Archway-road, Highgate, N.—Asst. M.O. £300.
Aylesbury, Royal Buckinghamshire County Hospital.—Hon. Consulting Surgeon to Throat, Nose, and Ear Dept.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Bath, Royal United Hospital.—H.S. At rate of £150.
Birmingham, Ear and Throat Hospital, Edmund-street.—Res. Anæsthetist. At rate of £150.
Birmingham, Selly Oak Hospital.—Cas. O. £200.
Bradford City.—Vacancies on Staff of City Pathologist and Bacteriologist. £600.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Bristol General Hospital.—Hon. Dental Surgeon.
Bury Infirmary, Lancashire.—Third H.S. At rate of £150.
Cardiff, Glan Ely Tuberculosis Hospital, Fairwater.—Asst. Res. M.O. £250.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road.—Two Hon. Assts. for Out-patient Department.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100–£175.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Colchester, Essex County Hospital.—H.P. £150.
Colchester, Royal Eastern Counties Institution for the Mentally Defective.—Research Worker. £750.
Dewsbury, New Dewsbury and District General Infirmary.—2nd H.S. £150.
East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. At rate of £200. Also H.P. At rate of £150. Also H.S. to Special Departments and Cas. O. At rate of £120.
Essex, Administrative County of.—Asst. County M.O.H. £500–£700.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Special Depts. At rate of £150.
Gloucester County and City Mental Hospitals.—Jun. Asst. M.O. £350.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Second H.S. At rate of £120.
Golden Square Throat, Nose, and Ear Hospital, W.—Hon. Reg. Also Hon. Clin. Asst.
Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. £150 and £140 respectively.
Hackney Hospital, High-street, Homerton, E.—Asst. M.O. £350.
Hereford, Herefordshire General Hospital. H.P. At rate of £150.
Hertford County Hospital.—Res. Surg. O. At rate of £250.
Hertford, County Sanatorium, Ware Park.—Asst. M.O. £300.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Dental S.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Asst. P.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., and H.P. Each at rate of £100.
Ilford, King George Hospital.—Asst. Res. M.O. £250. Also House Officer. £100.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150. Also H.S. At rate of £120.
Inverness District Mental Hospital.—Jun. Asst. M.O. £350.
Inverness Northern Infirmary.—3rd Res. M.O. At rate of £100.
L.C.C.—Eighth Asst. M.O. for Mental Hospital Service. £445
Leicester City Education Committee.—Asst. School M.O. £500.
Leicester City, General Hospital.—Res. M.O. £250.
Lingfield Epileptic Colony, Surrey.—Asst. M.O. £225.
London Hospital, E.—Asst. Surgeon.
London Lock Hospital, 91, Dean-street, W.—Two H.S.'s. Each at rate of £200.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Hon. Ophth. S.
Manchester, Ancoats Hospital.—H.S. At rate of £100.
Manchester and Salford Hospital for Skin Diseases.—H.S. £100.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.
Manchester City Education Committee.—Asst. School M.O. £600.
Manchester, National Radium Centre, Nelson-street.—Radium Reg. £350.
Manchester Royal Infirmary.—Jun. Asst. M.O. for Radiological Dept. £400. Also Dickinson Scholarship. £150.
Market Drayton, Salop, Cheshire Joint Sanatorium.—H.P. £250.
Merthyr General Hospital.—Res. H. S. At rate of £150.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Hon. Dental Surgeon.
Monmouthshire C.C.—Asst. M.O. £500.
Narborough, near Leicester, Leicestershire and Rutland Mental Hospital.—Locum Tenens. M.O. 7 gns. a week.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
New Zealand, Christchurch Hospital Board.—Med. Reg. £500.
Northampton General Hospital.—Two Asst. H.S.'s. Each at rate of £150.
Northwood, Middlesex, Mount Vernon Hospital.—H.S. £200.
Oldham Royal Infirmary.—Two H.S.'s. Each at rate of £175.
Orkney, Island of North Ronaldshay.—Med. Man under Scottish Board of Health. £400.
Plymouth, City Hospital.—Res. M.O. £350.
Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £100.
Portsmouth Royal Hospital.—Sen. H.S. At rate of £175. Also H.P., Two H.S.'s, and Cas. O. At rate of £130 and £100 respectively.
Preston and County of Lancaster Royal Infirmary.—H.S. and H.P. Each £150.
Princess Louise Kensington Hospital for Children, N. Kensington, W.—H.S. and Cas. O. At rate of £75.
Prince of Wales's General Hospital, Tottenham, N.—Sen. H.P.'s and H.S.'s. All at rate of £120. Also Jun. H.P.'s and H.S.'s. All at rate of £90.
Reading, Royal Berkshire Hospital.—Cas. O., and Res. Anæsthetist. At rate of £150.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Two Res. Anæsthetists. Each at rate of £80.
Rowley Regis Urban D.C.—Temp. Half-time Asst. M.O.H., &c. £300.
Royal Free Hospital, Gray's Inn-road, W.C.—Asst. Physician.
Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res. O. £150.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Clin. Asst.
Salop County Council.—Asst. M.O. £600.
Shanghai Municipal Council, P.H. Dept.—2nd Asst. Commissioner of P.H. 650 Tls. per mensem.
Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £180.
Sheffield Royal Hospital.—H.S. Also Ophth. H.S. Each at rate of £80.
South London Hospital for Women, South Side, Clapham Common, S.W.—H.P., and H.S. Each at rate of £50. Also Clin. Asst. to Surg. Out-patients.
Southampton Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £100.
Southampton, Royal South Hants and Southampton Hospital.—Asst. H.S. At rate of £180.
St. Bartholomew's Hospital, E.C.—Asst. Dental Surgeon.
St. John's Hospital, Lewisham.—H.P., H.S., and Cas. O. Each at rate of £100.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.
St. Peter's Hospital, 74, Vallance-road, E.—Asst. M.O. £450.
Stafford, Staffordshire General Infirmary.—H.S. At rate of £200.
Sunderland, Durham County and Sunderland Eye Infirmary.—Two Ophth. Surgeons. Each £350.
Swansea Hospital.—H.S. £150.
Taunton and Somerset Hospital.—Sen. H.S. At rate of £150.
Walsall General Hospital.—H.S. At rate of £150.
Walsall, Manor Hospital.—Res. Asst. M.O. £200.
Weir Hospital, Grove-road, Balham, S.W.—Sen. Res. M.O. £200.
West London Hospital, Hammersmith, W.—Hon. Ophth. S.
West Riding of Yorkshire, Middleton-in Wharfedale Sanatorium.—Jun. Res. M.O. £250.
Western General Dispensary, Marylebone-road, N.W.—Hon. Ophth. Surg.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Res. Sen. H.S., and Jun. H.S. At rate of £150 and £100 respectively.
Wigan County Borough Education Committee.—Asst. School M.O. £500.
Willesden General Hospital.—Two Clin. Assts.
Worcester, Besford Court Catholic Mental Welfare Hospital for Children.—Res. Med. Reg. At rate of £150.

ADDRESSES AND ORIGINAL ARTICLES

THERMAL ADJUSTMENT OF MAN AND ANIMALS TO EXTERNAL CONDITIONS.*

By Sir Charles J. Martin, C.M.G., M.B., D.Sc., F.R.C.P. Lond., F.R.S.,

DIRECTOR OF THE LISTER INSTITUTE OF PREVENTIVE MEDICINE; PROFESSOR OF EXPERIMENTAL PATHOLOGY IN THE UNIVERSITY OF LONDON.

LECTURE III.

In my last lecture I critically examined the evidence for diminution in resting metabolism in hot climates. The conclusion was that some people in hot climates reduce their resting metabolism 10 per cent. As, however, a reduction of 10 per cent. on resting metabolism, even if it continued during activity, would only amount to 2 per cent. when walking four miles an hour, its effect on anything except a vegetative life is insignificant.

On Heat Regulation in a Warm Environment.

When the environmental temperature approaches or exceeds that of the body, the only adjustment available is to rid the body of the heat formed by the evaporation of water. The amount of heat lost by evaporation from the upper respiratory passages is not inconsiderable, and is the principal means of refrigeration employed by a dog. A man working hard and breathing, say, one cubic foot per minute of air at a temperature of 97° F. and half-saturated with moisture, would lose by evaporation—assuming that the expired air were saturated at this temperature—0·43 g. of water in a minute, or 0·25 large calories in heat. These calories would, however, be but a 5 per cent. contribution to the loss of heat required in the case of a man at work or walking four miles an hour under the above circumstances. The rest must be lost by evaporation from the surface of the body.

Water arrives at the surface of the skin (1) by the imbibition of water by the epidermis from the moist cutis; (2) by the active secretion of sweat. It does not seem possible to express the imbibed water from epidermis, even by considerable pressures. I have tried to press liquid through skin from within outwards, using a pressure of two atmospheres. None passed through in 24 hours, unless the epithelial covering were defective. When an area of epithelium was removed leakage occurred, just as serum exudes from an abrasion of the epidermis during life.

Epidermis is composed of hydrophile proteins spread in a layer of 0·1 to 0·5 mm. thickness upon the cutis. It imbibes water from below and loses it from its free surface, although evaporation does not occur so readily from it as from a piece of wet rag. Only water molecules pass through the epidermis by transpiration, and salts do not accumulate on the surface as after sweating. Viale (1918) demonstrated experimentally that epidermis is impermeable to sodium chloride, and Hancock, Whitehouse, and Haldane (1929) found that, unless sweating occurs, the amount of salt that can be washed from the skin of a man unbathed for a week is trifling, although many litres of water must have passed by transpiration. In a normal person it is difficult to determine how much water is lost by transpiration alone, because the sweat glands begin to contribute without obvious sweat, but Loewy and Wechselmann (1911) were able to determine in two persons with congenital absence of sweat glands that 217 and 460 c.cm. respectively were transpired in 24 hours. Taking the higher figure, this would amount to a loss of 0·18 calories per minute. This would be quite inadequate to rid the body of heat when it had to depend on evaporation alone, and persons without sweat glands are obliged to avoid both heat and activity unless they wear a wetted shirt. That imbibition is enough to keep the epidermis from drying up is clear from the fact that most animals have no sweat glands over the greater part of their bodies, and from the observations of Zuntz and Tendau (1901) and Loewy and Wechselmann (1911) on persons with congenital absence of sweat glands. Imbibition will, however, never produce a damp skin.

The Conditions which determine Sweating.

As long as the skin is cool the activity of the sweat glands is in abeyance, but, as Anbert (1877) and Schwenkenbacher (1903) showed, it must not be assumed that because no sweat is obvious to the naked eye there is no secretion. By using either Anbert's or Jurgensen's (1924) method, a minimal secretion can be demonstrated, and I find that, in my own case, the sweat glands come into operation very gradually as my skin warms, and a sudden outpouring of sweat does not occur until the body temperature has appreciably risen. The most effective stimulus is a rise in the temperature of the blood-supply to the brain, and the easiest way to make a man sweat is to make him hyperthermic either by exercise or hot baths. The local temperature of the sweating part also has an influence.

The relative importance of local warmth and central thermal stimulation in the normal outpouring of sweat is difficult to assess, but the experimental evidence points to the latter as more essential. Filehne (1910) says that in a bath of 41° C. sweating began on the forehead before he could detect any rise in the rectal temperature, and ceased on plunging the hand into cold water. This he interprets as sweating following a generally warm skin inhibited by a stimulus of cold from a limited area. Leonard Hill (1921) made a similar experiment on himself in a room at 40° C. with the same result. When, however, he prevented the return of blood from the cooled limb by a rubber cuff, sweat did not cease over the rest of the body. He concluded, therefore, that the effect of plunging the hand into cold water was to add some cool blood to the general supply and so lower the blood temperature. E. Cramer (1890) and also Kittsteiner (1916) have endeavoured to analyse the relative effects of body temperature and local temperature on sweating. They enclosed one or both arms in air-tight vessels for the collection of sweat. The arms enclosed in the vessels could be immersed in baths of different temperatures, whilst at the same time the body temperature was raised by sitting in a hot room. When the temperature was raised enough to cause visible sweating over the surface generally, the cold arm sweated less than the warm arm. If sweating was profuse, the temperature of the vessels in which the arms were immersed had to be lowered to 10° C. to inhibit sweating, and sweating from the

* The Croonian Lectures delivered before the Royal College of Physicians of London on June 12th, 17th, and 19th. Lectures I. and II. appeared in THE LANCET of Sept. 13th and 20th respectively.

rest of the body ceased soon after. There seems, therefore, no doubt that the activity of the sweat glands is more readily called forth by direct stimulation of the sweat centre in the front of the *tuber cinereum* (Hasama (1929)) when the skin is warm, for if the skin is cold the inhibition of the centre must first be overcome. On the other hand, many individuals sweat from the forehead before a rise in body temperature occurs.

MATERIAL LOST TO THE BODY BY SWEATING.

I do not propose to enter into the composition of sweat, beyond pointing out that the sodium chloride present varies from 0·05 to 0·4 per cent. and accounts for about 80 per cent. of the inorganic constituents. According to Kittsteiner (1911), at the commencement of sweating the organic constituents preponderate, but as sweating becomes profuse the salts increase and ultimately exceed the organic substances, which gradually decrease. From the point of view of the effect of hot surroundings upon health, the organic constituents do not signify, but the amount of salts is not immaterial, for with the profuse sweating necessary to enable a man to work in hot climates or hot environments—such as stokers and miners often have to endure—enough inorganic salts may be removed from the body to cause trouble, since the water lost is usually replaced with ordinary water. I have calculated how much sodium chloride may be lost to the body in 24 hours, from data on the quantity of sweat secreted given by Moss (1923) and Hunt (1912). It seems that this may sometimes amount to 10–20 g. per day.

This subject has recently been illuminated by the researches of Moss (1923), and particularly by those of Hancock, Whitehouse, and Haldane (1929), who have shown that miners' cramp is due to "water-poisoning," and can be obviated by drinking 0·2 per cent. sodium chloride solution instead of water. In this respect, it is interesting to recall that some years ago Elliott (1908) recorded that the best means of treating miners' or stokers' cramp was with saline enemata. Moss records that miners working in an atmosphere of which the wet bulb temperature was 85° F., lost on an average two pints of water per hour by sweating, the maximum being 4½ pints. I understand from Hunt that a coolie can lose 10 per cent. of his weight, that is twice the volume of his blood, without ill-effect.

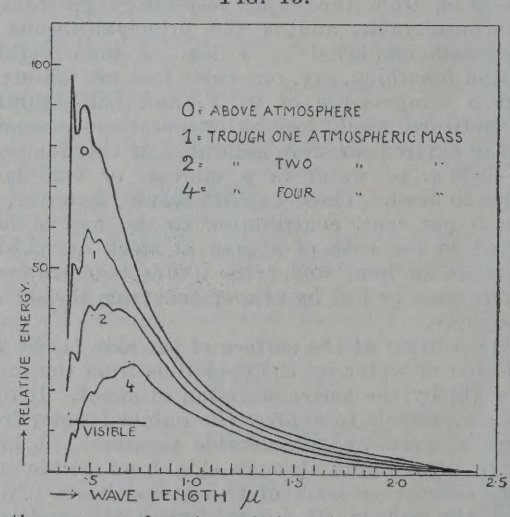
One would anticipate that, with all this outpouring of water through the skin, the blood would become more concentrated. As a matter of fact, the opposite occurs Gross and Kestner (1919), Cohn (1919), Eckert (1920), and Barbour (1924) have shown that with the onset of sweating there is a flow of water, salts, and proteins from the tissues into the blood stream, and the blood becomes richer in plasma and poorer in corpuscles. When sweating is profuse and prolonged, the water derivable from the muscles and the other tissues approaches the limit, and the blood concentrates. When this occurs the secretion of sweat diminishes and the individual is in danger of hyperthermia.

Sunshine and Heat.

The Contribution of Sunshine to the Thermal Profit and Loss Account.—It is common experience that sunshine with a low air temperature is grateful and comforting, but if the external temperature is high it becomes oppressive. Especially is this the case if hard muscular work has to be accomplished. The calorific value of the sun's radiant energy as it arrives at the outer limit of the atmosphere was determined by Abbot (1908) to be about 2 gramme-calories per sq. cm. per minute and the diminution of energy by passag through the atmosphere of different degrees of hazine and at different zenith angles, can be measured; bu just how much of this energy is absorbed by the huma body and added to its total balance of heat has onl been guessed at. Rubner and Cramer (1894) realise that it was considerable, and equivalent in effect t raising the air temperature from 25° C. to 33·5° C.

I have, during the last few years, been endeavourin to fill the lacuna in our knowledge. This is a heart breaking climate for work requiring a steady incidenc of sunlight; few days in the year are suitable, an on many of those days something happened to preven me from availing myself of the heaven-sent oppor tunity. Consequently, progress was slow. Fig. 1 represents how the total radiant energy of the su is partitioned amongst radiations of different wave length; it is borrowed from Abbot (1908). Th region of the visible spectrum, λ 390–770, is indicated It accounts for about 60 per cent. of the sun's energ above the atmosphere and 50 per cent. by the tim it reaches the earth. When the sun is in the zenit there are no radiations shown of wave-length shorte than λ 0·38μ in the near ultra-violet, nor longer tha 2μ in the infra-red, the reason being that Abbot' apparatus involved the use of glass; but 99 per cen of the total energy of the sun passes through glass The spectrum of the sun does indeed extend t

FIG. 13.



Relative energy of sun's radiation at different wave-length (O) as it reaches the earth's atmosphere (1), (2), (4), after passing vertically through one, two, and four atmospheric masses (zenith angle 0°, 60°, and 75° respectively). From observations by Abbot (1908).

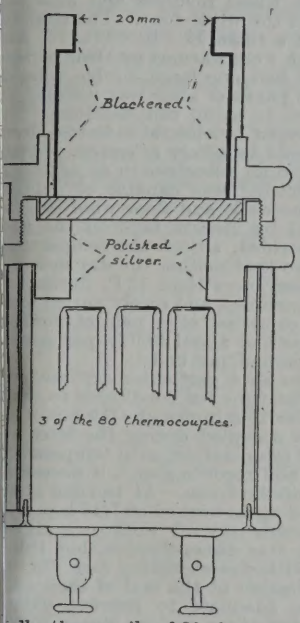
λ 0·29μ and it is these small wave-lengths which possess such high biological significance—e.g., in causing sun-burn and pigmentation and in the prevention or cure of rickets by the activation of ergosterol and formation of vitamin D. Their energy value is, however, small, and amounts to but a fraction of 1 per cent. of the total energy.

The chart also indicates how the energy of the sun is differentially absorbed as it passes through more and more of the atmosphere. Curve 0 represents the distribution of energy at the outside of the earth's atmosphere; Curves 1, 2, and 4, when it has passed through one, two, and four atmospheres respectively, the last two being obtained by taking observations at increasing zenith angles.

When radiations impinge upon a surface, a portion is absorbed and changed into heat; the rest is

eflected. I was concerned to determine the proporion of the total radiant energy absorbed by the uman skin, but, being enable to do this, I had to neasure the amount which is not absorbed but diffusely reflected. The difference gives the result required. To this end I used a sensitive thermopile in which the thermocouples were shielded from draughts by a glass window. It had 80 blackened thermocouples spread out over a circular area of 300 sq. mm. The general structure is seen in Fig. 14. The thermopile was in circuit with a sensitive microampèremeter, and the deflection of the galvanometer (not shown in the diagram) is proportional to the energy absorbed by the couples, which is about 98 per cent. of the radiant energy impinging upon them. In making the observations, the thermopile was momentarily presented to the sun and the deflection of the galvanometer read; the thermopile was then esented to the skin or clothing of an individual minated by the sun, and a second reading taken. number of readings of sun and reflected energy re made, noting each time the altitude of the sun. ving obtained these values some calculations had be applied to them.

FIG. 14.



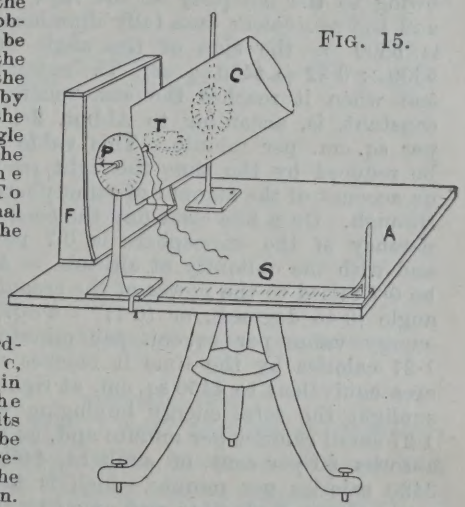
olls thermopile of 80 thermocouples (scale 9/10th) with blackened projection as employed in the experiments described in text.

The sun's rays being parallel and my pile correctly nted, the pile absorbed the whole energy of a beam sunlight, of which the sectional area corresponded the circular aperture of 314 sq. mm. in the pile, the diffusely reflected rays from the skin are ttered in every direction, and to gather into my rmopile an amount equivalent to the rays scattered m a surface of skin illuminated by a beam of light 314 sq. mm. in area, I should have to her the reflection from a flat surface similarly minated of infinite extent. This is impracticable. e largest more or less flat area of skin available a man's back is less than a foot square. It was essary, therefore, to have a projecting cylindrical e, blackened inside, in front of my thermopile own in Fig. 14) to reduce the solid angle of aperture, that at 10 cm. distance it would be completely d by light reflected from less than a square foot skin. The next difficulty was to ascertain the o of universally scattered radiations picked up by thermopile to those it would pick up if its solid le of aperture were 90 degrees, and it were exposed an infinite surface. This problem was entirely ond my capacity, but I was fortunate enough to st the sympathy of Professor E. A. Milne, F.R.S., xford, who found a solution for me. His mathetical reasoning is beyond my comprehension. He published the general solution in the *Philosophical Magazine* for February, 1929, showing that is the solid angle of aperture of my thermopile, ratio sought is $tan^2 \frac{\theta}{2}$.

Knowing the solid angle of aperture of my thermopile, I was now equipped with a factor to apply to my measurements of the energy picked up by my instrument from the limited area of skin filling its aperture, and so could arrive at the proportion diffusely reflected.

Fig. 15 shows the apparatus used. The solid table was adjusted to be horizontal. Its top was capable of rotation in a horizontal plane to follow the sun, alignment being indicated by the shadow of the upright, A, to the right of the picture on the scale. The length of the shadow on the scale, S, measured the altitude of the sun. The thermopile, T, enclosed in the cardboard screen, C, and shown in dotted outline, can be rotated on a horizontal axis at right angles to the scale. Attached to it is a pointer, P, which travels over a circle graduated in degrees. Supposing the length of the shadow indicated the sun's altitude at the moment to be 50°–10′, the pointer was moved to this reading on the circle and the front of the pile then pointed to the sun. To the left of the table a stout vertical wooden frame, F, is shown. Aginst this frame the back of the subject was rested and arranged to be as flat and vertical as was consistent with his anatomical peculiarities. For the examination of fabrics the vertical alignment could be secured by stretching them on a board applied to the frame. To obtain a reading of the energy reflected the pile was rotated so as to be at right angles to the surface examined, as shown by the position of the pointer P. The amount of deflection of the galvanometer observed had to be corrected for the obliquity of the illumination by dividing it by the cosine of the angle of altitude of the sun at the moment. To avoid additional illumination of the surface under examination by skylight, the thermopile was enclosed in a hollow cardboard cylinder, C, about a foot in diameter. The inclination of its axis could be varied to correspond with the altitude of the sun.

FIG. 15.



Horizontal rotating table (about 1/12th scale) showing arrangements described in text for "shooting" the sun and pointing the thermopile at right angles to the skin. The thermopile T is enclosed in a cardboard cylinder C so that the skin shall not be illuminated from the sky.

Before experimenting with human skin I made measurements with a particular sample of white blotting paper until I had surmounted many technical difficulties and could obtain consistent results on different days, whatever the altitude of the sun. The following table summarises the results I obtained:—

Material.	Percentage of sun's energy diffusely reflected.	Percentage absorbed or passed.
Blotting-paper	78	22
White cotton shirt, two thicknesses, unstarched	71	29
Khaki cotton shirt	43	57
Dark grey flannel suiting ..	12	88
Dress suit	5·5	95
Black velvet	3·2	97
Skin, fine white	45	55
,, average blonde	43	57
,, dark, brunette (Semite) ..	35	65
,, ,, ? some negro blood ..	30	70
,, ,, Hindu	22	78
,, ,, Negro	16	84

The amount regularly reflected from skin is not great, but I have not been able to determine this accurately. In the case of a piece of shiny brown wrapping paper, more shiny than skin, I was surprised to find it was only 3·3 per cent. of the total incident light.

We are now in a position to answer the question: how much energy in heat units a man may absorb when exposed to the sun? This will obviously depend upon the amount of surface illuminated. With a vertical sun a man lying down exposes much more surface to the sun's radiation than when standing up. With a nearly setting sun the result will be reversed. It will also depend upon the obliquity of the illuminated surface, the amount of atmosphere the sunlight has traversed, and the haziness of that atmosphere. For all these reasons we can only deal with a concrete instance. Suppose the sun be at an altitude of 55 degrees, which is about what it is in June in London for an hour or two around mid-day. At this altitude I happen to know that my shadow, standing erect and naked, is 5500 sq. cm. The illumination of this area is, however, attenuated owing to the obliquity of the rays to the vertical, and the equivalent area fully illuminated by the sun is 5500 × the sine of the angle of altitude, or $5500 \times 0{\cdot}82 = 4450$ sq. cm. The radiant energy of the sun when it reaches the atmosphere, or the solar constant, is, according to Abbot, 2·1 small calories per sq. cm. per minute. This value will, however, be reduced by the time the light reaches my body on account of the amount of atmosphere it has passed through. On a fine clear day the coefficient of transparency of the atmosphere is 0·7 per atmosphere, and with the obliquity at altitude = 55 degrees will be 0·7 raised to the power of the secant of the zenith angle (0·45 degrees), or $(0{\cdot}7)^{1{\cdot}4} = 0{\cdot}607$, so that the energy value per sq. cm. per minute will be but 1·27 calories by the time it reaches me. With an area equivalent to 4450 sq. cm. at right angles to the sunlight the total energy impinging will be 4450 × 1·27 small calories per minute and, as my naked skin absorbs 60 per cent. of sunlight, $4450 \times 1{\cdot}27 \times 0{\cdot}6 = 3420$ calories per minute, which is three times my resting heat production and equal to the amount of extra heat I should produce by walking three and a half miles per hour on the flat.

Work and High External Temperature.

The amount of work a man can do under temperate climates depends upon the muscular development and skill of the individual and the amount of oxygen he can bring to his muscles in unit time; in other words, his respiratory and circulatory capacity. At high temperatures these factors operate, but the limit of accomplishment also depends upon the rate at which he can get rid of the heat inevitably formed. This involves a good deal of work upon the heart, so that the efficiency with which external work can be performed depends upon the climatic conditions. Some years ago, in 1913–14, I set out to try to determine whereabouts this climatic limitation was situated in my own case. To this end I decided to keep the work at a constant level and chose a rate of work equivalent to 1/10 h.p. which, I understood from my engineering friends, was what they considered to be the output of a good labourer during hard manual work. It has since emerged from the observations of Moss (1923) upon the oxygen utilisation of a hard-working miner, first, whilst heaving coal and subsequently working upon my bicycle ergometer until he consumed the same amount of oxygen, that I was very nearly correct in my choice of 3300 ft. lb. (456 km.) per minute as a standard of economi performance.

To measure the work accomplished I designed a simp form of bicycle brake-ergometer. The tension on the brak band could be set to give any desired rate of work and has the merit of not changing its coefficient of friction wit the velocity with which the wheel revolves and does n require an assistant to record the work done. The climat conditions were produced in a room 12 × 10 × 9 ft. It ha three inside walls, all of which were warmed on their outsi by adjustable radiators. It had one large double windo and the air between the two panes of glass was warmed b a long coil of resistance wire, to avoid condensation. Th interior of the room was warmed by electric radiators, fro which the output of heat could be nicely adjusted. Stea was introduced by a pipe from an autoclave in an adjoinin room and the quantity admitted was capable of delica adjustment from inside. The walls and floor were cover with felt and the air mixed by electric fans on the flo at the corners. I could, unaided, adjust the temperatu and humidity of this room, so that neither the dry bulb n wet bulb thermometers varied more than 1° F. during t three or four hours of an experiment and rarely varied mo than 0·5° F. My clothing consisted of a pair of runnin pants and I had an air current of about 250 ft. per minu impinging upon the upper part of my body.

Having arranged the room at a particular dry and w bulb temperature and allowed time for conditions to sett down, I proceeded to work for 15 minutes at 1/10 h.p. × 4/ I then dismounted and was occupied during the next fi minutes in taking my rectal temperature, skin temperatu pulse- and respiration-rate, and recording and, if necessar adjusting the temperature of the room. At the end of t five minutes I remounted and again worked at 1/10 h.p. × 4 for another 15 minutes. In this way my work over all w at the rate of 1/10 h.p. It was discontinuous, but this usual in manual labour. With one exception (see Fig. 1 I did not increase my respiration at the end of each spe so my cardiac output was adequate to prevent oxyg debt. The experiments lasted three or four hours, duri which, if thirsty, I drank some weak tea without milk sugar. The results will be apparent from the two cha (Figs. 16 and 17) in which rectal temperature is plott against time.

It will be seen from the charts that the rect temperature varies at the commencement of t observations. This is because, in the severer climat conditions, the light work involved in arrangi the experiment and adjusting the temperatures the room to the desired points made me slightly hype thermic. During the first working hour the bo temperature rose, ultimately coming into adjustme at varying levels, according to the severity of t conditions, and remaining so during the whole of t period. I sweated profusely, losing 1 to 2 lb. in weig per hour after the initial warming up. The maxim wet bulb temperature I could endure under these co ditions was 87° F. (see Fig. 16), and it did not see to make any difference to me whether the simultaneo dry bulb was 86° or 101° (Fig. 17). This suppo Haldane's (1905) contention, from experiments up himself and Boycott, sitting in a hot room, that wh heat regulation has to depend almost entirely up sweating the effect of the temperature of the d bulb is immaterial.

The upper curve in Fig. 17 illustrates wh happened when I failed in adjustment, but st continued working at the same rate, as long as dared. You will notice that at the time I desist my temperature had risen to nearly 103°, pulse 15 and respiration 48. I felt a palpitation in my ne and throat and increasing incapacity for effort, b after a few minutes' rest, still at a dry bulb temperatu of 98° and wet bulb of 88°, my respiration and pu slowed down and the body temperature soon aft returned to a reasonable level. It is surprising wi what suddenness these symptoms occur. If a subj cannot adjust for a body temperature of 103° F. is in a vicious circle, for as the body temperature ri the heat formation, independently of work, also ris Harvey Sutton (1909) found that even when reposi in a chair in a hot room his gaseous metaboli

increased 50–100 per cent. when his rectal temperature reached 103·5° F. The breakdown in my case appeared to be entirely circulatory. In the effort to facilitate loss of heat, more blood is diverted to the skin, and unless the minute volume of the heart can be increased to compensate for this divergence there is not enough oxygen supplied to the muscles to prevent oxygen debt. Once this occurs it soon becomes impossible to carry on at the same rate of work.

That a rise of 1–3° F. occurs with exercise, even when there is no great strain put on thermotaxis, is so universal that Zuntz and Schumberg (1901) and Pembrey (1913) suggest that it is a physiological adaptation rather than a failure of compensation; much of the transference of heat by evaporation takes place too far from the capillary loops wherein the blood to be cooled circulates, and a proportion of the heat absorbed by evaporation will be derived from the air and surrounding objects instead of from the body.

In my experience the obstacle to work in hot climates is, for the European, as much a social as a physiological one. It is clothing. The coolie works with his nice brown body exposed and covered with sweat, and is jolly, whereas the white man distressfully labours in a hyperthermic condition, straining his heart to work a refrigerating plant which he has rendered inefficient because his sense of dignity forbids him to expose his skin.

FIG. 16.

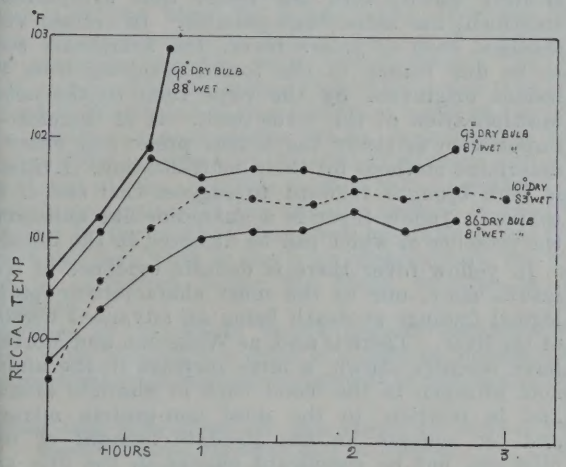
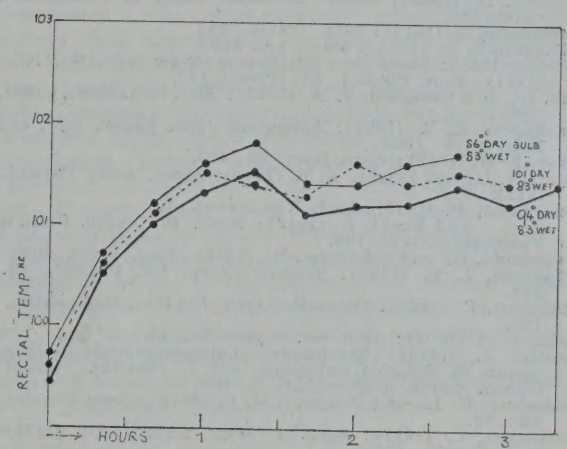


FIG. 17.



Influence of working at 1/10 h.p. (456 kilogramme metres per minute), under different atmospheric conditions, upon body temperature.

with this I agree. Every physiological process works quicker a little above average body temperature and oxygen is more readily dissociated from hæmoglobin, but I think another advantage is that with a slightly raised temperature the same amount of heat can be got rid of per minute without diverting so much of the blood to the skin.

Work in hot surroundings demands a stout heart. The individual has to do not only the external work demanded, but also to run a refrigerating plant to rid him of the heat inevitably formed. That, no doubt, is why young vigorous persons do best in warm climates and why breakdown of thermotaxis is particularly likely to occur when weary towards the end of the day. Walking at four miles an hour requires about the same oxygen consumption as performing work at 1/10 h.p. on the ergometer so that it produces the same amount of heat. What this amounts to in heat output per minute is readily calculated: 1/10 h.p. is 3300 ft. lb. per minute, or 456 kilogram metres. As the efficiency of a man is not more than 20 per cent., four times this amount of energy is liberated in the form of heat. The equivalent of 1842 km. is 4·35 large calories which, added to an average resting heat production, makes about 5·5 large calories. I have already indicated that if the work is performed in the sun another four or five calories may have to be added to the amount of heat to be removed per minute. In a climate the shade temperature of which is at or above that of the skin, ten large calories have to be removed by evaporation of water. This would require the evaporation of a litre an hour even when the whole of the heat to do this is derived from the body. If clothes are worn, unless very thin and wet,

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GUANIDINE-LIKE SUBSTANCES IN THE BLOOD IN EXPERIMENTAL YELLOW FEVER.

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THE specific chemotherapeutic treatment of diseases due to ultra-microscopic viruses has, up to the present, entirely failed, with the result that symptomatic treatment has alone been possible. In certain virus diseases, such as yellow fever, the symptoms seem to be due rather to the toxins resulting from the lesions originated by the virus than to the actual multiplication of the virus itself. It is therefore of importance to study the toxins present in order to determine methods for their neutralisation. Evidence is here brought forward to suggest that one of the toxins in yellow fever is a guanidine-like substance, the presence of which can be detected in the blood.

In yellow fever there is definite evidence of liver insufficiency, one of the most characteristic pathological findings at death being an advanced necrosis of the liver. There is also, as Wakeman and Morrell [1] have recently shown, a large increase in the amino-acid nitrogen in the blood both in absolute amount and in relation to the total non-protein nitrogen and an increase in the absolute amount of urea nitrogen, but no significant change in the uric acid concentration of the blood. Blood creatinine is only slightly increased. Now the observations of Minot and Cutler [2] in 1928 showed that in liver necrosis brought about by carbon tetrachloride or chloroform, there occurs an increase in the guanidine or guanidine-like substances in the blood. More recently the same workers [3] have determined a similar increase in guanidine-like substances in eclampsia and in the liver necrosis associated with arsphenamine poisoning, while Ellsworth [4] has this year reported similar findings in six cases of arsphenamine jaundice, five cases of Laennec's cirrhosis of the liver and one case of Banti's disease. Guanidine estimations of the blood in five patients with hæmolytic or obstructive jaundice fell within the normal range.

Since there is an increase in guanidine-like substances as the result of poisoning by compounds such as carbon tetrachloride and chloroform it is of interest to note that these intoxications are characterised by nervous hyperexcitability, followed by depression, and by a gastro-intestinal irritation evidenced by vomiting, diarrhœa, and frequent hæmorrhages. Now there is not lacking evidence that these symptoms are due, at least in part, to intoxication with guanidine compounds. Frank, Stern, and Nothmann,[5] for instance, in 1921, recorded the following symptoms in dogs as the result of poisoning with guanidine compounds—tremor, restlessness, hoarse barking, salivation, vomiting, diarrhœa, apathy, weakness, and death. Minot and Cutler noticed fibrillary twitching of muscles, with more or less severe tetanic convulsions followed by extreme depression, weakness, and death. Vomiting was common and the vomitus was often bloody. At autopsy the pyloric end of the stomach and upper third of the small intestine showed extreme congestion

th many small hæmorrhagic areas. This is the ea in which, according to Carter,[6] hæmorrhages e constantly found in yellow fever in man. It ll thus be seen that there are certain similarities tween carbon tetrachloride poisoning, guanidine isoning, and yellow fever.

In addition the changes in the blood-sugar are nilar in character in the three conditions, for Minot d Cutler[3] have reported hypoglycæmia in carbon rachloride and guanidine poisoning, while iczynski,[6a] Gomes,[7] and Wakeman and Morrell[1] have ınd a quite definite decrease in the blood-sugar in llow fever both in man and monkeys.

Observations on Monkeys.

It appeared to be of interest therefore to determine ether there was an increase of guanidine-like ostances in the blood in yellow fever. For this rpose observations were carried out on *Macacus sus* monkeys infected with yellow fever. The thod employed in the earlier observations was that scribed by Major and Weber[8] which is based on the our reaction for guanidine bases described by gs[9] in 1924, modified by Marston,[10] Pfiffner, and ers,[11] and others. By this method it is necessary make a correction for the creatine present in the od, but in the method described by Pfiffner and ers,[12] and here used in the later observations, the of a correction factor for blood creatine is necessary.

Reference to the table shows that in monkeys ected with yellow fever there is a definite increase the guanidine-like substances present in the blood.

GUANIDINE-LIKE SUBSTANCES IN THE BLOOD OF NORMAL *Macacus rhesus* MONKEYS AND OF THOSE WITH YELLOW FEVER.

Condition.	Guanidine-like substances in mg. per 100 c.cm. of blood.
Normal.	0·210
—	0·180
—	0·148
—	0·296
—	0·160
—	0·210
Immune.	0·140
Yellow fever.	0·400
,, ,,	0·498
2nd day after inoculation with yellow fever.*	0·240
3rd ,, ,, ,, ,, ,, ,,	0·460
4th ,, ,, ,, ,, ,, (moribund).	0·493
Before inoculation with yellow fever.	0·210
3rd day after ,, ,, ,, ,,	0·320
4th ,, ,, ,, ,, ,, ,,	0·416
6th ,, ,, ,, ,, ,, (moribund).	0·430
Yellow fever (moribund).	0·424
Yellow fever.	0·421
Yellow fever (moribund—5 c.cm. calcium lactate one hour before).	0·312
Yellow fever.	0·436

*No fever.

ow Minot and Cutler[13 2 3] have emphasised fact that calcium salts have a highly protective on in preventing and treating intoxications ciated with an increase in the guanidine base ent of the blood, at the same time raising the d-sugar. It was, therefore, hoped that the inistration of calcium lactate to monkeys with ow fever would have some curative action; con- ently 5 c.cm. of a 5 per cent. solution of calcium ate were given to monkeys with yellow fever, peritoneal injections being given at intervals of hours. Such injections of calcium lactate oubtedly reduce the amount of guanidine-like substances present in the blood, as shown by the following protocols:—

MONKEY 346, suffering from yellow fever: 9 A.M. guanidine bases in blood, 0·400 mg. per 100 c.cm. of blood; 11 A.M. 5 c.cm. of 5 per cent. solution of calcium lactate injected intraperitoneally; 1 P.M. guanidine bases in blood, 0·251 mg. per 100 c.cm. of blood; 6 P.M. guanidine bases in blood, 0·498 mg. per 100 c.cm. of blood.

MONKEY 359, suffering from yellow fever, 2nd day after inoculation: 10 A.M. guanidine bases, 0·421 mg. per 100 c.cm. of blood; 10 injections of 5 c.cm. of 5 per cent. solution of calcium lactate and 2 per cent. glucose then given at intervals of 4 hours till 7 P.M. on the following day; 10 P.M. moribund, guanidine bases, 0·262 mg. per 100 c.cm. of blood.

Unfortunately, calcium lactate, even when injected with glucose, does not appear to have any action in preventing the final collapse and death in monkeys suffering from yellow fever, despite its action in reducing the guanidine-like substances in the blood. Nevertheless, the post-mortem examination of monkeys thus treated has revealed one interesting fact. While the necrotic condition of the liver is similar to that found in control monkeys, the animals (8 in number) treated with calcium lactate have all exhibited a freedom from gastro-intestinal and pulmonary hæmorrhages, lesions which are usually found in 60 per cent. or more of monkeys dying from yellow fever. Consequently, there is some evidence that the hæmorrhages in yellow fever may be controlled by the administration of calcium lactate, which may therefore be of use in the treatment of human cases of yellow fever. It should be emphasised that the effect of the calcium in reducing the amount of guanidine-like substances does not last for more than a few hours, as shown in the experiment recorded above. Repeated injections of calcium at short intervals are therefore indicated.

In view of the extremely low blood pressure, possibly associated with the presence of toxic amines in the blood, it seems not improbable that the intravenous injection of saline or of gum arabic as used in the treatment of surgical shock would also be of value in the treatment of yellow fever in man.

Conclusions.

(1) In experimental yellow fever in monkeys there is an increase in the blood content of guanidine-like substances, similar to that associated with other conditions involving liver necrosis. (2) The increase in guanidine-like substances can be reduced by the administration of calcium lactate. (3) Calcium lactate does not prevent death in monkeys suffering from yellow fever but does tend to prevent hæmorrhages.

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CONGENITAL ARTERIOVENOUS FISTULÆ.

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(*Concluded from p. 628.*)

It is difficult to determine whether or not some of the early cases should be classified as congenital arteriovenous aneurysm, for the clinical and pathological data are not abundant. Short abstracts will be made of the history of the cases which can properly be regarded as congenital arteriovenous aneurysm, and the results of the treatment of these then analysed.

History of Reported Cases.

Letenneur, 1859.—Patient was a man of 43 years, who, when 7 and 22 years of age, bled profusely from an injury of his right ring finger. The lesion involved the hand and forearm, extending up to the elbow. An amputation of the arm had to be done finally because of hæmorrhage.

Krause, 1861.—Male, aged 33. When 8 years old a vascular tumour was noted in the palm of the left hand between the index and middle fingers. Finally the hand and forearm became involved. Atrophy of the finger developed. Pain developed and became so intense that the arm could not be used. The extremity was 1½ inches longer than the right. A dog bit the patient in this hand when he was 26. This had no relation appearently to the vascular lesion. Compression was tried as a curative procedure, but had to be given up because of the discomfort it caused. Finally an amputation of the arm was performed. An abnormal communication was found between the median artery, a branch of the ulnar, and the digital arteries and veins.

Gross, 1867.—Female, aged 43. Patient was admitted to the hospital with an enlargement of the left foot and leg from back of the toes to as high as the knee. The vessels were dilated and pulsated. A thrill and bruit could be felt and heard over the vessels. An ulcer the size of a shilling was present on the dorsum of the foot. This bled occasionally. This would heal when the foot was elevated. A nævus maternus was present when she was born. The superficial veins and arteries became tortuous and increased in size at the age of 3 years. Six years later the ulcer appeared near the web of the great toe, and about four years before her admission to the hospital ulcers developed on different portions of the foot, the largest being over the internal malleolus. An attempt made at one time to ligate the femoral artery was unsuccessful, although two arteries were apparently ligated at the inner and upper portion of the leg. Subsequently, the leg was amputated below the knee. The internal saphenous vein was dilated and tortuous, with thickened coats, resembling an artery. The vessels of the amputated leg were injected with tallow and magnesia. The injection was made through the posterior tibial artery. The injection mass passed not only into the superficial and deep veins and arteries, but escaped from the medullary canal of the tibia and fibula. The posterior tibial artery was nearly as large as the femoral, and the accompanying veins were tortuous and nodular. The posterior tibial was the only artery that could be identified in the specimen. No mention made of the bradycardiac reaction or cardiac changes.

Hewett, 1867.—Sarah R., aged 17. The mother stated that when the child was born her right thigh was larger than the left, and the veins of the extremity were dilated. The girl stated that as long as she could remember there had been a peculiar beating in the leg. At first the swelling was confined to the thigh, but it soon extended into the leg and finally to the foot. This caused her little inconvenience unless she walked some distance or stood for a long time. Then the veins became much larger. Later some of the veins near the ankle had broken, and for this the patient came to the hospital.

Examination.—The right lower extremity was much enlarged, being increased not only in circumference, but it it was at least two inches longer than the left. The superficial veins were much dilated, and appeared as large, convoluted and tortuous cords under the skin. They were soft and compressible. The femoral vein was much enlarged and a distinct vibratory thrill could be felt. This could be trac up to the junction of the two iliac veins, but no thrill co be felt in this. A very loud, continuous-blowing murm could be traced up the vein to the same spot. A loud syst murmur could be heard at the apex of the heart. On lower part of the outer side of the leg was a large crust at point where bleeding had ccurred.

Operation.—A few days after admission to the hospi hare-lip pins were placed under all the veins which could seen running in the direction of the point of hæmorrha The vessels were then compressed by a twisted suture pla over the needle. The needles were allowed to remain 28 days. They caused very little irritation, but gradua produced thrombosis of the veins. The patient wh discharged was in much the same condition as when admitt the thrill and bruit remaining the same.

There was no history of trauma in this case, nor of dise which might account for a spontaneous arteriovenc fistula. The fact that the thrill and bruit terminated abrup where the common iliac artery (on the right side) lies up and crosses the common iliac vein, appears to indicate t point where the communication existed. The enlargeme and lengthening of the extremity and the dilated veins—noted at birth—indicate the congenital origin of the lesio

Gherini, 1867.—Girl, aged 9½. When the child was months old it was noted that the left hand was warmer a larger than the right. When the child was two, a tum appeared on the dorsum and palm of the left hand. T veins of the hand and forearm were greatly dilated. T tumour was treated by compression. At 7 years the tempe ture of the left hand was distinctly elevated. A tumour size of a florin appeared on the dorsum, and a sma one on the palm of the hand. These disappeared as result of direct pressure and compression of the brach radial, and ulnar arteries. They reappeared when press was removed. Pulsation could be distinctly seen, and a b heard. The veins of the hand and forearm were m dilated. The brachial artery was enlarged and tortuo Gherini regarded the lesion as a congenital aneurys varix. He successively ligated the radial and ulnar arter The symptoms, although less pronounced, persisted after ligation. The lesion remained about the same and did seem to progress.

Obalinski and Browicz, 1874.—Jewess, aged 30, for e years had noticed a vascular tumour in the left hand forearm which has increased, especially after each pregna This had been regarded as racemose angioma. Bleeding v gangrene of the finger occurred An amputation through arm was performed.

Nicoladoni, 1875.—17-year old male, shoemaker. genital vascular tumour of the right hand and finger. increased in size when the patient was 9 years of age, finally reached to the supraclavicular region. Ves most marked in the arm, where they showed distin through the skin. There was a decided increase in le of the extremity, and an increase in circumference u 5½ cm. when the arm was permitted to hang down. circumference was reduced by compression. Of spe interest in this case are the cardiac changes and the p reaction.

This is apparently the first case in which the car changes and the bradycardiac reaction are noted. apex-beat is recorded as diffuse in the fourth and f intercostal spaces. Its beat was distinct in the paraste line and one inch outside the mammillary line. The car dullness begins in the sixth interspace out, ½ in. to the of the mammillary line, and passes to the right into l dullness. Over the apex, sixth intercostal space, out the mammillary line, a rough systolic murmur can be h and a distinct diastolic tone. A like murmur, but wea can be heard over the lower third of the sternum. Over base of the heart and pulmonary area the same auscultat phenomena are heard. Over the aorta there is hear continuous murmur.

Nicoladoni, 1876.—This surgeon observed another le of this type in a bricklayer, aged 22. This lesion apparently congenital. Since he was two years of vascular tumours had been noted on the third, fo and fifth fingers, in the palm, and on the dorsum of the hand. The patient complained of pain, weakness, cramps. The skin also became ulcerated. The increas circumference of the hand was about 5 cm., and there wa increase in length of this side of 6 cm. The functio the hand was fairly good, although there was some discon and disability. No operation was performed. Bandages applied.

Israel, 1877.—Girl, aged 9. The right leg is larger tha left. The thighs and feet on both sides are the same Veins prominent in the skin, an ulcer of which had pers for some time. Pulsation noted in the upper two-t

of the leg between the crest of the tibia and the peroneal region. Posteriorly, pulsations were not noted or other changes. Thrill most pronounced at the point where anterior tibial artery pierces the interosseous membrane. This point marks the upper boundary of the pulsating area. A loud bruit is heard here, which in the description corresponds to the machinery-like murmur heard in this type of aneurysm. The right femoral artery is wider than the left. This statement applies also to the external iliac. No thrill is felt when the hand is placed on the femoral artery as it passes over the pubic bone. A thrill is felt, however, over the femoral vein at the level. The pulse wave in the right dorsalis pedis is delayed. In the right posterior tibial the pulse appears at a perceptible interval than in the left, but considerably earlier than in the dorsalis pedis on the same side. The apex-beat of the heart is diffuse and entirely to the left of the mammary line. Both the right and left heart are dilated.

The impression was that the lesion was a vascular, pulsating, malignant growth; perhaps a telangiectatic sarcoma with ulceration of the surface, or a disease of the vessels. The diagnosis of a diffuse dilatation in the region of the anterior tibial was made. This developed from the telangiectases and extended peripherally to the beginning of the veins. The changes in the femoral and iliac vessels, the hypertrophy and dilatation of the heart were the result of the increased resistance to the circulation of the blood. Some measure of this resistance was afforded by the pressure in the femoral and iliac arteries and the changes in the apex-beat.

On March 3rd, 1876, the femoral artery was ligated at the apex of Scarpa's triangle. The artery was thin walled. Directly after ligation pulsation ceased in swelling in the leg, which collapsed. The pulse dropped from 96 to 72. Two hours after ligation it was 64; five hours later 42. The rhythm was regular. That evening the patient complained of pains anteriorly over the right knee. The toes were cold, livid and hyperalgesic. On April 11th, Langenbeck performed an amputation through the lower third of the thigh. The patient gradually recovered from this. It is interesting to note that on August 2nd the tension and width of both femoral arteries were the same, and that the right external iliac artery, which had been tortuous and dilated, resembled quite closely the left. The heart had greatly diminished in size.

An examination of the amputated leg showed that the popliteal artery—likewise the popliteal vein—was dilated. The anterior tibial artery is larger than the posterior tibial. This artery was the size of the femoral artery of a child corresponding in age. It became considerably larger distalward until the ulcer in the leg was reached, when it became narrower and was of normal size at the ankle. Numerous thin-walled, lateral branches, as transparent as silk paper, accompanied by thin-walled, dilated veins, were seen off from the principal artery. A solution of fuchsin passed directly through these arteries into the veins. The examination showed that relatively large veins arose from abnormal blood spaces—blood spaces which had a direct communication with the arteries. The arteries and veins communicated with each other without the intervention of capillaries. The lesion was, therefore, a congenital arteriovenous aneurysm.

VON EISELSBERG, 1899.—Female, aged 26. When 4 years old the right leg was found to be larger than the left. Later cramps occurred in the right lower thigh. When the patient was 12 years old ulcers developed without injury over the malleoli of the right leg. These did not heal. Frequent attacks of severe pain occurred, associated with redness and swelling of the extremity. The great toe became discoloured, blebs developed, and the nail came off. The patient was admitted to the hospital because of increasing pain and aggravation of symptoms. When the operation was performed a ligature was placed upon the femoral artery below the profunda. The artery at that point was dilated, its wall was thin. The saphenous vein was ligated just distal to the opening of the femoral. Severe bleeding occurred from the edges of the wound. The day following the operation severe pain was noted, temperature 102·2° F. Three days after the operation the temperature continued high, severe pains developed in the foot, which became cold, discoloured and gangrenous. Anæsthesia developed in the leg and foot. Four days after ligation amputation was performed through the upper part of the thigh. In the specimen, when dissected, was found a large aneurysmal varix involving the popliteal vein and artery. The communication was small and the artery itself was not dilated. The short saphenous vein was thickened and tortuous. Pulsations had been observed at this point.

There were no cardiac changes in this case. The case is noteworthy in that it was one of the early ones in which a direct communication between the vein and artery without the interposition of a capillary bed was demonstrated.

VON SCHRÖTTER, 1899.—Violin player. All the arteries and veins of the left arm became thickened, dilated and tortuous following a strain in gymnastic exercises. New atypical vessels have formed. These form a prominent pulsating elastic swelling on the hypothenar eminence. Loud bruits are heard, and the patient complains of a heavy, pulsating feeling in the entire extremity. The ulnar artery in its upper third was ligated and 1 cm. of the same resected. The pulsating sensation disappeared, and the swelling in the hypothenar eminence became easily compressible. Schrötter thought that in order to completely cure this that it would be necessary to ligate the radial artery, to destroy the dilated vascular spaces by a galvanopuncture, and excise the large venous trunks. Final result in case not given.

BRAUN, 1901.—The patient, a 43-year old male, had had as long as he can remember, in the course of the radial artery above the wrist-joint on the right side, a small tumour. The veins of the right hand and forearm were more marked than those of the left. He had no particular trouble until year before entrance to the hospital, when the hand began to enlarge and cause him severe pain.

Examination.—The right brachial artery was twice as thick as the left, tortuous, and had marked pulsations. The lower end of the radial artery is tortuous, and on it were four aneurysms varying in size from a hazel-nut to a walnut. The hand was red, hot, and sweating. The cutaneous veins of the hand and forearm are extraordinarily full. If the extremity is elevated the veins empty; when lowered they fill. If the brachial artery is compressed, the veins empty. The muscles are atrophied, and there are changes in the joint surfaces of the fingers which resemble arthritis deformans. The sensitivity of the skin is also reduced.

The aneurysms of the radial artery were extirpated. No abnormal communication between the artery and veins was found. After the operation the pain ceased. The other symptoms gradually increased. This was a congenital lesion, and there is difficulty in differentiating it from a cirsoid aneurysm. Ligation of the brachial artery was considered, but not performed because of the effect it might have on the arm. The patient was able to work, and nothing further was attempted.

BALLIN, 1913.—M.F.H., 30-year old steam fitter, had always enjoyed best of health; never used alcohol to any extent. No history of infection. August 11th, 1911, he tried to stop a sliding steel casting with his right hand, hyperextending the hand at the wrist with great force. He felt a sharp pain, and the next day noted the veins on the dorsum of the injured hand were much swollen. Some of these were excised, the attending physician thinking they were varicose. Swelling of the veins returned immediately, and extended slowly to the little finger and on the palmar side into the hypothenar region. The hand was swollen, perspiring profusely, and causing intolerable pain. In spite of repeated operations upon the vessels no relief was experienced, and on Oct. 12th, 1912, the little finger with its metacarpal bone was removed. Hæmorrhage profuse.

The microscopic report is as follows: The specimen from the little finger is a blood-vessel tumour consisting of a large mass of veins (just like the cayus cavernosum). No malignancy. On account of the progressive nature of the lesion an angiosarcoma was thought of. Later, Nov. 14th, 1912, a dilated arterial sac was ligated, which undoubtedly communicated with some large veins. The dilated part was excised and the communication ligated. On Dec. 23rd, 1912, the cavernous mass had returned in the ring and middle fingers, and on Jan. 13th, 1913, an amputation of the forearm was performed. The pathological report by Dr. Warthen, of Ann Arbor, is as follows: The vessels have greatly dilated lumina and much thickened walls, showing that the vascular changes must be of some chronicity, probably congenital, the condition developing after trauma, as has been observed in a number of cases of this rather rare and interesting condition.

EBSTEIN, 1913.—Patient, 24-year old mechanic. A diagnosis of questionable aneurysm of the subclavian artery had been made. The patient had asthma during the winter, and often suffered with "bronchial catarrh." For a year he had complained of a scratching feeling in the neck. Since he was twelve years of age he had noticed that the clothes which his mother made were too short for his left arm and he had observed that his left forearm was longer than the right. Hands were apparently of the same size.

On physical examination the striking finding was a loud thrill, especially in the left supraclavicular fossa. Distinct palpatory findings not noted over the brachial, axillary, radial or ulnar arteries. A bruit is heard in the region of the left elbow over the brachial artery. A distinct thrill is felt at this point. The veins of the left upper extremity are distinctly enlarged. Particularly striking was the dilatation of the cephalic vein, the median basilic vein, and the subcutaneous veins on the radial side of the forearm. The

interosseous artery when the forearm is grasped seems to pulsate distinctly and strongly.

The patient worked as a mechanic. There was no feeling of weight in the arm. The skin was livid. The heart was not enlarged, and the tones were clear. X ray revealed no changes in the heart shadow, and there were no changes in the subclavian artery. The blood pressure on the affected was higher than on the normal side. No mention is made in this case of the bradycardiac reaction. No operative interference attempted.

Ebstein mentions, in a note to the description of this case, another one. This was a private patient of Strümpell's, aged 14, who had had since birth a lesion of the right forearm, which was 3 cm. longer than the left. No other mention is made of this case, and I am unable to find any other mention of it in the literature. The patient evidently had a congenital arteriovenous aneurysm.

PUSCH, 1914.—Boy, aged 12. The entire right upper extremity was affected. The supraclavicular, axillary brachial, radial, and ulnar arteries are markedly dilated. Two sharply circumscribed dilatations were found upon the radial and ulnar arteries, the size of a pfennig or pea, not far from the wrist-joint. A continuous murmur was heard over these. In the palm of the hand more such circumscribed dilatations were found. Besides these were a number of angiomatous nodules, bluish-red in colour, and compressible on the fingers. The right arm was 5¼ cm. longer than the left and considerably warmer. Two small ulcers were present at the terminal phalanges of the third and fourth fingers. Pusch regarded this case as noteworthy because of the extent of the disease; marked enlargement of the heart because of increased work, and relative aortic insufficiency. Prognosis grave; it being scarcely doubted that the lesion would become worse during the year. Final result not stated.

EBSTEIN, 1918.—Male, aged 49. At the age of 32 the patient had complained of rheumatic pains in the left arm and especially of tingling in the finger-tips. During the past five years an increasing swelling of the veins of the left upper extremity had been noted. After walking some distance the extremity became heavy. The length of the right forearm was 29 cm.; of the left, 31 cm. The left forearm measured when the fingers were extended 45¼ cm.; the right, 42 cm. The circumference of the right arm was 25 cm.; of the left, 28½ cm. The circumference of the right elbow was 26½ cm.; of the left, 29 cm. A distinct thrill could be felt in the left supraclavicular fossa and a loud blowing bruit heard. The entire left upper extremity felt considerably warmer than the right. A distinct difference in radial pulse was noted. Heart tones normal. No enlargement of the heart noted. The final outcome in this case is not recorded.

HALSTED, 1918.—The patient was admitted to the Johns Hopkins Hospital in 1911. When the child was three days old the mother noticed a throbbing swelling in the child's neck. Right-sided headaches, earaches, toothaches lasting two or three days, and frequent epistaxis were complained of. Throbbing in the neck gradually increased. On physical examination a pulsating tumour was found beneath the lobe of the ear on the right side. The ear pulsated synchronously with the heart beat. No dilatation of superficial veins of the face. An aneurysmal sac was found behind the ascending ramus of the jaw. A continuous thrill and bruit were present which disappeared when pressure was made over the venous sac or the carotid artery. The internal jugular vein was dilated. At operation the external jugular vein was found to be enormous. It was excised. An H-shaped plexus of dilated, pulsating veins was found. Beneath this mass of veins considerable proximal dilatation of the common and external carotid arteries was noted. The internal carotid artery was small. One communication existed between the external carotid artery and sinus-like veins which were dissected free and removed. The external carotid artery was ligated proximally. The pulsation and thrill ceased. When the first dressing was made, six days later, the thrill, bruit, and visible pulsation had returned.

The patient was admitted to the Johns Hopkins Hospital again in 1918. The throbbing and swelling of the right side of face had become worse since the operation. The veins of the face were dilated. The patient's face appeared cyanotic and the veins of the face were dilated. A tumour was noted at the angle of the jaw. This, the size of a hen's egg, pulsated, and a continuous thrill and bruit which were transmitted over the face could be heard over it. The pulsation was more forceful than before the operation. Pressure over the tumour caused the thrill and bruit to disappear, and distention of the veins of the face. The heart was normal. The aneurysm now involved the right parotid, new channels had apparently developed. The temporal vein was ligated at this time. Double ligation of a so-called aberrant artery and vein and a large medial vein caused obliteration of the fistula, with disappearance of the thrill and bruit.

Subsequent examination made upon this patient revealed a disturbed vascular mechanism. The lesion was progressive, the entire face eventually showing an angiomatous change. This patient has not been cured. It is undoubtedly a case of congenital arteriovenous fistula, in which multiple fistulæ exist between the external carotid and ascending pharyngeal artery and large anomalous sinus-like veins. The anastomosis was of the end-to-end type. Careful studies of the heart were made but no changes found.

SONNTAG, 1919.—Girl, aged 16. Since birth a bluish discoloration of the ball of the right thumb had been noted, likewise elevation of temperature, abnormal amount of pain, increased secretion of sweat and pigmentation. Increased blood pressure on the right side. The affected extremity was larger than the normal. An ulcer developed upon the volar surface of the thumb, which apparently bled quite profusely. When the patient was 14 years of age a resection of the radial and adjacent arteries with veins was performed. The arteries and veins in the upper third of the forearm communicated with each other. Nine months later, because the lesion had become worse and bleeding from the ulcer, resection of the veins in the forearm and hand was performed. Two years later, because the lesion was still progressive in the ulnar vessels, a resection of the ulnar artery below the elbow was performed, combined with elevation and constriction. When the report was made the lesion was stationary and the ulcer had healed.

RIENHOFF, 1924.—Male, aged 20, admitted to Surgical Service of the Johns Hopkins Hospital, Jan. 7th, 1924. He complained of a pulsating, rumbling mass in left side of neck. When the patient was three weeks' old the parents noticed a pulsating swelling on the left side of the neck immediately below the lobe of the ear. As far back as the patient can remember he had always had this throbbing pulsating tumour; but he thought that it had not increased in size more rapidly than the structures about it, so that relatively it was no larger than at birth. Frequent attacks of epistaxis occurred, which were difficult to control. As a boy, the patient had noticed that he was definitely more short winded than his playmates. This condition was, however, never embarrassing. There were never any symptoms indicating a cardiac lesion. At times the patient experienced attacks of dizziness, especially after severe exercise, excitement, or pressure on the left side of the neck. There was always a roaring and rumbling in the neck which could be easily heard over the head, but which bothered him only at night when lying on the left side. A tight collar caused a large vein on the left side to become larger, and the left side of the face to feel much warmer.

On examination, a pulsating tumour was found on the left side of the neck, below and to one side of the angle of the mandible on the left side. The left ear was displaced laterally with each pulse beat. The arterial pulsation on the left side was approximately twice as wide in excursion as on the right side. On palpation, a buzzing thrill and machinery-like hum could be felt over the left side of the neck and head. The maximum intensity was over an area just below the angle of the jaw, where there was a forceful expansive pulsation. The thrill was transmitted into the superficial veins, both distally and proximally, the veins seeming to have an arterial pulsation.

When pressure was made at the base of the neck on the left side, just above the middle of the clavicle, a large vein measuring about 3 cm. in diameter filled from above downward. This pulsated vigorously. The common carotid artery could be palpated throughout its length. It seemed to be almost three times as large as the one on the right side. The common carotid artery did not seem increased in length. It was not tortuous. The temporal artery on the left side was smaller than on the right. There was no suggestion of a collapsing pulse. Occlusion of the left common carotid artery caused cessation of pulsation in the aneurysmal tumour and disappearance of the thrill. Complete occlusion of the left common carotid artery was associated with a feeling of dizziness and diplopia. The pulse decreased from 20 to 30 beats per minute, while the systolic and diastolic blood pressure increased 20 mm. On auscultation a marked rumbling, to-and-fro, machinery-like murmur was heard over the entire left side of the head and neck, the maximum intensity being over the point of greatest pulsation in the tumour.

Examination of the eye grounds revealed very interesting changes. The left retina was more vascular than the right, having a lighter shade of red. The margin of the disc was not as sharp on the left side as on the right. The retinal veins on the left side were much larger, more tortuous, a lighter shade of red, and pulsated more vigorously. Occlusion of the left common carotid or pressure at the point of communication caused a cessation of pulsation in the retinal veins and a marked decrease in size. Pressure on the large vein at the left side, probably the external jugular, caused a marked engorgement of the left retinal veins.

The pulsation extended into the mouth, causing the left tonsil to move upward and toward the median line.

When the external and internal carotid arteries were exposed some interesting changes were found. (Fig. 14.) The internal carotid was very small, and the external carotid artery was much dilated up to the point where it crossed under the large vein. The external carotid artery passed upward and towards the midline, making a turn about the digastric muscle and then running lateralward under the large external jugular vein, where the artery again turned for the second time and passed under the mandible on the left side in the general course of the external maxillary artery. As the artery passed under the mandible it became smaller, rapidly approximating in size a normal artery. No internal jugular vein was found.

Eight fistulous communications were dissected out between the external carotid artery and the anomalous external jugular vein. Three of the fistulæ were situated on the posterior aspect of the vein, and five on the anterior. The uppermost fistula trifurcated just before entering the vein. The upper anterior fistula was closed by a lateral suture of the arterial wall. Complete cessation of the thrill and pulsation did not occur until the last communication had been divided. The artery and vein were completely separated, the lumina being patent when the operation was completed. The patient was completely relieved by this operation.

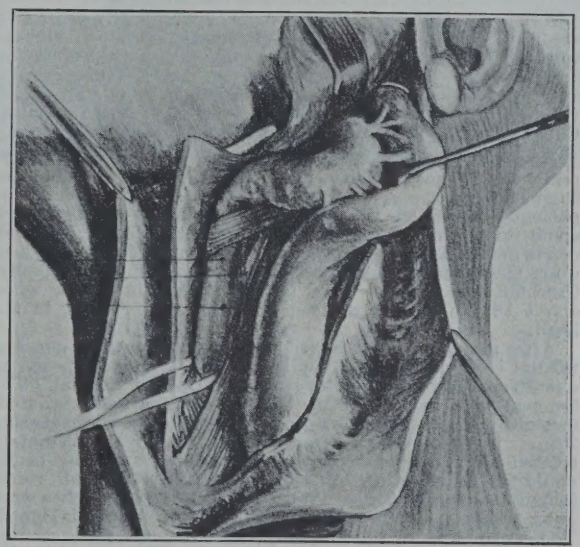
REID, 1925.—Male, aged 18. Five years before admission to the Johns Hopkins Hospital a puffing noise was noted in the region of the right shoulder and neck. Six months later, after severe exercise, a soft pulsating mass about the size of the end of the little finger was noted in the right supraclavicular fossa. This increased steadily in size. When examined, a large mass was found which involved the right side of the neck and the supraclavicular region. Dilated vessels in and beneath the skin gave the appearance of earthworms. Marked pulsation was noted in the larger veins. A continuous bruit and thrill were heard over the mass. The external jugular vein was greatly dilated. Electrocardiogram and teleorentgenogram were normal.

On Feb. 25th, 1929, the anterior half of a large mass of veins forming part of the aneurysm was excised, and a large artery, probably the transversus colli which communicated directly with one of the distended veins, was divided. On May 28th, 1920, the internal and external jugular veins were excised, and the subclavian vein ligated proximally and distally to a wide communication between the subclavian vein and the aneurysmal veins. The fistulous communication between the subclavian artery and the sinus-like veins was ligated. The subclavian artery was also ligated distally and proximally to the thyroid axis. The fistulous communications were about the size of the little finger, and seemed to run end-to-end into venous trunks. The veins posteriorly forming a part of the lesion were not excised. There was no pulsation or bruit following the operation. The patient was cured.

This case undoubtedly represented a congenital arteriovenous fistula, with multiple fistulous communications, end-to-end, between the subclavian artery and transversus colli arteries and the venous sinuses. No cardiac changes were noted in this case, although the lesion had lasted at least five years, probably much longer. The fistulous communications between the arteries and veins were quite large. They did not seem to function, judging from the history until the patient was about 13 years of age, when, suddenly, channels which had remained latent opened without any apparent cause. From the time that the openings developed there occurred a rapid and progressive growth of the tumour, as in the Halsted case. In both of these the anastomosis was end-to-end. There was no evidence of new growth in the sections, and the direction of the blood flow and intravascular pressures were directly and primarily responsible for the enlargement and apparent growth of the vessels.

REID, 1925.—Female, aged 35. When five years old the patient fell, striking the right knee. An unusually large hæmatoma developed. It was noticed then that the right leg was larger and longer than the left. The veins were slightly dilated. Until the patient was 22 years of age there were cramps had been noticed in the leg and a marked dilatation of veins. The leg was bluish in colour and the patient wore a bandage for support. Following an attack of diphtheria, the patient remained in bed eight weeks because of pain in the leg. When 30 years old the patient noticed throbbing and pulsation in the veins of the leg. He remained in bed six months. Cocaine was required to relieve pain. An operation for varicose veins was performed elsewhere. Some dilated superficial veins were removed. Hæmorrhage—difficult to control—was brisk. The circulation in the leg was much impaired after the operation. The right leg was found upon examination to be 6·5 cm. larger than the left. Blood pressure in the right leg 160/25; in left leg 140/65. A systolic thrill and continuous bruit can be felt and heard over the right femoral and iliac arteries. Venous engorgement of the right leg from the knee to the dorsum of the foot is noted. The right leg is larger than the left. The popliteal artery on the right side is greatly dilated and tortuous. A continuous thrill and bruit can be felt and heard over it, most marked on the outer side anterior to the upper end of the fibula. The posterior tibial and dorsalis pedis on the right side are smaller than on the left. The bruit could be heard over the entire leg, but would disappear when the anterior tibial artery was occluded by pressure. When the leg was elevated and the veins

FIG. 14.



Reproduction of figure from Rienhoff's article, showing the lateral communications between arteries and veins. Cure followed division and ligation of these communicating vessels. In the second case, reported in this paper, the ligation of the communicating vessel could be made, and the signs and symptoms of an aneurysm disappeared.

collapsed the tibia felt rough (moth eaten). Roentgenogram measurements indicated that the right femur was 1·5 cm. longer than the left; the right tibia 5·5 cm. longer than the left, and the right fibula 4·5 cm. longer than the left. The right tibia was apparently perforated by large canals through which vessels ran. The nutrient artery was larger than normal. No cardiac change; the teleoroentgenogram and electrocardiogram were normal; the Wassermann reaction negative.

Operative Procedures.—The popliteal vein was enormously dilated and filled with arterial blood. The anterior tibial artery was ligated and divided at the interosseous membrane; it was very thin and dilated. The popliteal vein was ligated and divided above and below the junction with the anterior tibial veins and then excised upward. All the geniculate branches of the popliteal artery were ligated. The bruit was reduced in intensity by ligation of the anterior tibial artery. The popliteal artery was thin and much dilated. Ligation of the lower lateral geniculate artery caused cessation of the thrill. Two days after the operation the bruit returned; 85 hours after the operation a hæmorrhage, followed by gangrene, occurred, and an amputation was performed above the knee. The anterior tibial artery had ruptured proximal to the ligature; the ligature had not slipped. An examination revealed that five branches of the anterior tibial artery ran into the tibia, communicating with a sort of reservoir which was drained by five tributaries to the veins accompanying the artery.

ERDHEIM, 1926.—R. S., aged 32. In 1917, a sack of potatoes, weighing 80 kg., fell upon the right shoulder. About three weeks later the patient noticed under the right clavicle a dilatation of the vessels, and within a short time a dilatation of the vessels of the right arm was noted. Nine months after the accident distension and tenseness of the abdomen appeared. During childhood the vessels were more marked in the right forearm than in the left, and the extremity was thicker and longer. In the hypothenar eminence of the hand was a bluish compressible mass, projecting 1 cm. above the level, which had the characteristics

of a hæmangioma. Compressible, no thrills, no pulsation. The skin over the veins was thinned. It appeared as if the veins would rupture. The mass is painful. The subcutaneous veins in the thenar eminence are dilated and tortuous. The subcutaneous veins on the volar surface of the forearm are tortuous, the size of a lead pencil. They empty into a vein at the bend of the elbow, the size of the thumb. The vein corresponding to the basilic is tortuous and greatly dilated. These are easily compressible and move beneath the skin. The radial, ulnar and brachial arteries feel wider than normal, and pulsate stronger than normal. The hand, especially about the hypothenar eminence, feels warmer than the left. This patient suffered from nose bleeding, hæmorrhage from the skin, and late in the course there developed a thrill and bruit synchronous with the pulse, which could be heard in the lower third of the arm.

Autopsy Findings.—Cirrhosis of liver with beginning atrophy. Perihepatitis and perisplenitis, chronic; chronic splenic tumour. Varices of the œsophagus, with perforation and ascites. Phlebectasiæ parietis dextri thoracis and extremitatis superioris dextræ; angioma et telangiectasiæ volarmanus dextræ. Parotitis pawlenta acuta dextra. Congenital tumour made worse by an injury at 26.

PERTHES, 1927.—Woman, aged 27. When 3 years of age and wearing the first shoes, the left foot was larger and longer than the right, and the entire leg was swollen. Since the patient was 10 she has had cramps in the leg and dark spots on the outer and inner sides of the foot. Bleeding ulcers made the patient go to bed. Five operations performed upon the vessels without result. The wound healed badly. Gradually increasing pain in the knee-joint, and when about 18 the patient noticed pounding and roaring in the head.

After many days' rest in bed the bruit was localised over the medial condyle and the popliteal fossa. When exposed at operation the femoral artery appeared about normal. The femoral vein, on the other hand, was markedly dilated, measuring from 2 to 2½ cm. A thin-walled vein measuring 2 mm. in diameter was found upon the artery intimately related to it. When compression was released the bruits could be heard; those in the adventitia, the small veins, felt like a vibrating wire. When small lateral branches were cut it was seen that they were filled with bright arterial blood. Ten centimetres of the femoral, whose exposed walls seemed to be thinned in places, were resected. The wound healed well, circulation good, but, seven days after resection, bruits and thrill heard and felt over the medial condyle, which became more intense and extensive. Pain in foot and paræsthesia reappeared, and patient again complained of pounding heart and roaring in the head. Veins as prominent and full as before the operation. In view of the arthritis the thigh was amputated at junction of middle and lower third. The relation between the vessels in the popliteal fossa was like those in a traumatic arteriovenous fistula, with the exception that in the traumatic there is one communication; while in this there were many, and it seemed as if the arterial blood passed through a wide meshed sieve into the veins. This abnormal communication occurred in a congenital angioma. Whether the tissue found in the popliteal fossa was a growing angioma is not decided.

RÖSLER, 1928.—Boy, aged 15, always healthy, no injury. When 7 years old definite changes were noticed in the right hand. The right upper extremity is larger than the left. There is a soft part and swelling on the thenar eminence of the right hand and the base of the second finger. The swelling is elastic. Venous markings prominent about the swelling. Veins in the cubital fossa dilated. In the region of the brachial and radial arteries marked pulsations palpable and thrills. At the end of the radius on the volar side a pulsating mass of vessels is found. The veins on the dorsum of the hand have visible and palpable pulsations. A systolic and diastolic bruit are heard over the vessels. Temperature of forearm and hand elevated. Hand darker than left. When the extremity is elevated skin becomes paler. Skin bluish-violet in colour. Blood pressure: right, 120/70; left, 105/70. Cardiac: apex-beat fifth intercostal space in the midclavicular line, heaving and diffuse. Cardiac dullness extends on right, one and a half finger-breadths of the sternal margin, to the left and above, no widening. At the apex loud 1 and 2 tones; over the base pure tones. Second pulmonic somewhat louder. Lying, 82. Sitting, 84. Standing, 100 rhythmic. Compression of the right forearm or arm: no changes in frequency of beat, and only slight lowering of blood pressure. Electrocardiogram: no variation from normal. Rontgen: heart was spherical, moderate enlargement of both sides. Transverse, 13·7 cm.; thorax, 23 cm.; pulsation within normal. Compression of right forearm or arm gives no changes in size of heart or excursion. Outcome not recorded.

PEMBERTON AND SAINT, 1928.—A man, aged 30, visited the Mayo Clinic in 1925 because of a progressive abnormality of the right upper extremity. This had always been larger than the left. When 13 years old he injured the little fing on the right side while playing baseball. Ankylosis gradual developed. Even a slight abrasion of the finger requir from one to two months to heal. In 1918 he began to noti that the veins on the back of his hand were becoming mo prominent, and that there was a tendency to numbness the affected arm and hand.

He first visited the clinic in 1922, when a typical arter venous thrill was felt at the base of the thenar and hypothen eminences. A bruit with systolic accentuation could heard over the thrill. Atrophy and gangrene of the dist phalanx of the little finger were noted. An arterioveno aneurysm of the right ulnar artery and vein, just distal to t annular ligament, was excised, and the artery proximal to t aneurysm was enormously dilated, the diameter bei about 25 cm. The radial artery was exposed and found communicate with a large vein in the anatomical snuff-bo The ankylosed little finger was amputated at this tim In 1923 ulceration of the index-finger occurred. There w no history of trauma. Gangrene occurred. The patie returned and the finger was amputated. The patient becar gradually worse and the right hand became a hindran In 1925 dry, atrophic ulceration appeared at the site of t amputated index-finger and on the middle finger. The hea was markedly enlarged, and a marked systolic thrust w seen over the lower part of the præcordium. There was systolic murmur over the base. No signs or symptoms cardiac decompensation were present. The venous blo in the neighbourhood of the arteriovenous communicati contained so much oxygen as to be almost arterial.

Amputation was performed through the forearm. D section of the specimen disclosed dilatation of both arteri and veins, and multiple fistulæ between them. It is of intere to note in this case that while the solution fills the dilat proximal arteries and veins, the more distal vessels are on partially filled because of the short circuiting, due to t fistulous communications.

PEMBERTON AND SAINT, 1928.—A man, aged 24, enter the Mayo Clinic in 1922. The right foot had been larg than the left as long as he could remember. In 1909 ingrowing great toe-nail was operated upon. Infecti occurred and pus was discharged for four years, the t eventually turning black. In 1913 there was a sudd hæmorrhage from the dorsum of the right foot near t metacarpophalangeal joint; the bleeding was stopped binding the foot. The great toe was amputated in 191 and since that time there have been several hæmorrhage The patient had noticed that the right foot was much swolle and he felt pulsations in the foot, leg and thigh. An ulcer tion on the dorsum of the right foot persisted. A ye before the patient's admission to the clinic an operati was performed. It is probable that the anterior and posteri tibial vessels were ligated. All the superficial veins of t right leg were greatly dilated. Thrills and bruits we present from Poupart's ligament distally as far as the toe The right foot felt like a mass of spongy tissue. Pressu over the internal saphenous vein immediately caused t foot to swell. There was a loud blowing, systolic, apic murmur, and the lesion of the heart was diagnosed chron mitral endocarditis, with regurgitation (as the patient ga a history of previous rheumatic fever, the condition of t heart could not be attributed unequivocally to the lesi in the lower extremity).

At the first operation, May 4th, 1922, the anterior tibi artery and the veins on the dorsum of the foot were ligate The artery just proximal to the transverse crural ligamen was dilated to a diameter of about 3·7 cm. The wall w markedly thinned. The arteriovenous communication cou not be definitely located. At the time of the second operatio July 20th, the bruit and thrill still extended above th popliteal space; the leg was amputated in an attempt t preserve a useful stump. All veins were markedly enlarge some to a diameter of 3·75 cm.

The patient was examined August 16th and the conditio found to be satisfactory. The veins were not enlarge as before the operations, and no thrill could be felt or bru heard.

PEMBERTON AND SAINT, 1928.—A girl, aged 16, w admitted to the Mayo Clinic for a lesion of the left foot. H mother stated that from the time the patient was a baby t left foot had not seemed quite normal, and when the chi reached the age of 8 years this foot seemed to be hott than the other. Three years later small scabs began appear on the dorsum of the toes, gradually increasi in size and accompanied by a discharge of greenish pu Because of the spread of the ulcerous area, the out four toes were amputated in March, 1924. The girl w told at this time that she was suffering from tuberculosis the foot. The great toe was amputated in November.

Posterior to the internal malleolus was an area abo 3 cm. in diameter over which a distinct thrill synchronous wi the pulse was palpable. On the dorsum of the foot a simil

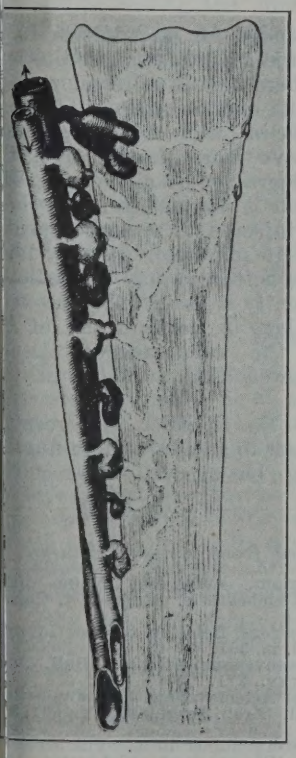
thrill could be felt over a larger area. On auscultation a loud, continuous bruit, with exacerbations corresponding to the systole, could be heard. This bruit, although of maximum intensity over the areas mentioned, could be heard as far proximally as the middle of the calf. The legs were equal in length. The heart was not enlarged. The first initial sound was accentuated. Calorimetric studies were made with the Stewart Hegeries foot colorimeter, and the left foot was emitting nearly 12 times as much heat as the right. The venous blood from the left foot contained more than four times as much oxygen as that from the right, and consisted of nearly pure arterial blood.

On June 26th the dorsalis pedis and posterior tibial arteries of the foot were ligated. As a consequence the foot seemed to improve for a short time. After a few weeks the foot began to cause pain again, and the scab-covered sinus at the distal end of the foot did not show any signs of healing. The foot was amputated. Pathologically this seemed to be a case of multiple varicose or cirsoid aneurysms.

PEMBERTON AND SAINT, 1928.—Man, aged 20 years. At birth the right arm was larger than its fellow. Symptoms were not noted until he was 11 years of age, when he began to have spells during which the arm became swollen and painful with accompanying malaise. After the second spell, the wrist and fingers became ankylosed and suppuration of the middle finger occurred. When examined, an arteriovenous bruit was heard in the palm and also in the clavicular region of the right side.

At operation the radial and ulnar arteries were ligated and divided, and all the vessels in the neighbourhood of the wrist-joint were enlarged. The hand was reduced one-third in size, and the bruit and pulsation were considerably reduced following the operation. The patient was seen again in 1920. Six months previously he had noticed a dark scab over the first joint of the little finger. A month previous to this visit the scab gave place to progressive ulceration. Amputation through the middle of the forearm was performed.

FIG. 15.



This diagrammatic drawing is from the case reported by Reid. Amputation made necessary by gangrene which followed operation. The multiple communications which exist between artery and vein, extending even into the bone, render cure of such a lesion practically impossible.

The patient returned in 1924 because of swelling in the region of the right clavicle. There was swelling in the supra- and infra-clavicular fossa on the right side. The stump of the right forearm was about three times the normal size, but tapered off toward the shoulder. A systolic pulsation was visible in both clavicular areas, and a systolic thrill most pronounced was felt in the supraclavicular space. The whole arm pulsated with each systole. A loud, continuous bruit, with systolic accentuation, could be heard through the right arm and clavicular region, most marked in the supraclavicular space. The superficial veins of the right arm were dilated to three or four times their normal size. The heart was markedly enlarged, the apex-beat being visible in the sixth intercostal space. Blood from the veins on examination was almost arterial in character as determined by the oxygen saturation method. No further operative interference attempted. Patient cannot be traced. Several attempts have been made. No mention made of bradycardiac reaction.

Summary.

The 30 cases which have been studied in this paper, 24 in the literature and six of my own, indicate the difficulties which may be encountered in the treatment of lesions of this type. The operative treatment is more difficult than that of traumatic arteriovenous aneurysms because the communications are usually multiple, and frequently so situated, when the aneurysm occurs in the extremity, that they cannot be reached. How difficult obliteration of some of these communications may be is indicated by one of Reid's cases (Fig. 15), in which there were multiple communications between the arteries and veins. The communications in the bone itself were almost sinusoidal in character. In Case 1, reported by me, the X ray picture indicates the difficulties, for the radius contains many large foramina through which undoubtedly the arteries and veins communicate directly.

In six of the cases in which the aneurysm occurred in the upper extremity (Letenneur, Krause, Obalinski, Ballin, Pemberton (2)), amputations had to be performed either because of repeated hæmorrhages which could not be controlled, or what has seemed to the surgeon having charge of the case as the malignant nature of the lesion. Malignant in the sense that the vessels enlarged rapidly and destroyed tissue. These lesions, however, show in no instance any relation to malignant hæmangiomas or other tumours which form metastases.

In seven cases (Gross, Israel, Eiselsberg, Reid, Perthes, Pemberton (2)) amputation through the lower extremity has been necessary. In some of these the amputation was necessitated by gangrene which followed ligation of the principal artery. It is interesting that gangrene has followed ligation of the femoral artery, even at the site of election. The dangers associated with ligation of the vessels of the lower extremity in this type of lesion seem to be much greater than after ligation for other causes. Gangrene has supervened and amputation has been performed some time after the ligation.

In three cases has operation been followed by a complete cure. In Rienhoff's case the multiple lateral communications between the artery and vein could be exposed and each one closed; in Reid's case the vessels communicating with each other could be excised, and in Case 2, mentioned by Lewis in this paper, the small communicating vessel could be ligated. In this last case the signs and symptoms associated with the aneurysm disappeared after the

FIG. 16.

Ulceration of the skin occurred over many of the large sinuses in which thrombosis occurred after operation in which the brachial artery was ligated, and the large vein in which the machinery-like thrill was heard, removed. The thrombosis occurred even in many of the vessels of the small muscles in the palm of the hand. Some mummification of the end of the thumb occurred almost six weeks after the operation.

operation, but a mass of veins still persists in the skin over the lower third of the humerus posteriorly.

I have recently had an opportunity to examine the patient referred to under Case 1. Fig. 16 is a photograph recently taken. In this many ulcerating areas covered by crusts are found in the skin. These ulcerations occurred over dilated vessels in which thrombosis was occurring. Thrombi developed in the vessels of the small muscles of the hand, and contracture of the fingers is due, I believe, to the organisation of the thrombi. This patient has improved decidedly since the operation, but a thrill can still be felt and a bruit heard over the outer side of the lower third of the arm. The bradycardiac reaction can no longer be elicited. Enough facts have been cited to show the difficulties that may be encountered in the treatment of congenital arteriovenous aneurysms. Of the 27 cases in which the aneurysm occurred in the extremities, amputation has been performed in 13, about 48 per cent. Multiple operations may be required. I believe that the large veins in which the thrill is greatest and the bruit loudest should be attacked first, when possible, after the artery has been closed temporarily by a rubber-shod clamp. Ligation of the arteries in the extremities has been followed by a high percentage of gangrene, and even in Case 1, reported in this paper, some mummification of the thumb followed ligation of the brachial artery or the circulatory changes subsequent to it.

The bradycardiac reaction will disappear when a great amount of blood is no longer shunted directly into the veins from the arteries. A heart which has been dilated and decompensated as the result of the disturbed vascular mechanism will return to normal when the fistulous communications are closed or removed by amputation. The return to practically normal of a badly damaged heart is illustrated by Israel's case, in which an amputation was performed above the level of the aneurysmal communications.

Congenital aneurysms do not differ from the traumatic relative to the bradycardiac reaction and the cardiac changes. Whether or not these are present depends upon the amount of blood shunted directly from the arteries into the veins, no capillary bed intervening.

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(*Continued at foot of next column.*)

ON EXCRETION UROGRAPHY.

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EXCRETION urography is now fairly generally practised, and it must prove a most valuable aid in the diagnosis of urinary tract lesions. Since April the method has been used on some 36 cases in the Surgical Unit at Cardiff, and a brief account of the experience gained may prove helpful. Most of the cases dealt with were out-patients. It was hoped that more complete and precise diagnoses would in this way be possible without recourse to instrumentation of out-patients, and so something would have been done to lessen the pressure on hospital beds.

Previous papers have outlined the interesting history of the subject; while there is no question of the new method displacing the old, it is not to be wondered at that since the introduction of cholecystography attempts have been made to find some opaque substance which would be excreted by the kidneys in sufficient concentration to provide readable pyelograms, ureterograms, and cystograms.

Method of Administration.

I have not thought it necessary to eliminate the possibility of iodine idiosyncrasy before the injections. The iodine in uroselectan is in a stable form of organic combination, and as such passes through the body unchanged. Iodism had not been observed in any of the cases.

The quantity recommended for an adult is 40 g. This means having to inject 100 c.cm. of solution. If 60 g. are used then there is still more solution to inject. It is by no means easy in some patients to find a vein suitable for the injection of so much fluid, and two cases really gave more trouble than the ordinary retrograde pyelography usually does. The recently prepared solution is warmed to body heat and may be quite safely injected all at once provided it is injected slowly (10–15 minutes). A very large syringe is useful. It is better to use a needle as large as can be conveniently inserted into the vein. Every care must be taken to prevent any of the solution leaking into the subcutaneous tissues. Painful induration followed this accident in two cases.

Dosage and toxicity.—No ill-effect has resulted from giving 60 g. of the salt to an adult. In a number of cases I have given 60 g., but generally the resulting

Bibliography continued from previous column.

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pyelograms were little, if any, better than when 40 g. were given. A kidney which is functioning poorly gives a very indistinct shadow in spite of the increased uroselectan injected. At the time of the injection there may be transient thirst and a sensation of tingling and warmth of the skin. No serious symptoms have been observed. In one case of polycystic disease in which the blood-urea was 160 mg. per 100 c.cm. a dose of 60 g. produced no untoward effect whatever. It also produced no shadow. The kidney function must be very bad before the test becomes dangerous.

Preliminary preparation of patient.—The value of clearing the large bowel of gas cannot be too much stressed. These pyelograms are at best often faint, but yet perfectly capable of accurate reading provided they are not fouled by large bubbles of gas. Several results were ruined through neglecting this small matter. A good purgative is given at 2 P.M. on the day preceding the test. Enemata are not recommended.

Radiography must be of the very best. Shadows are too often too faint to be useful; but, on the other hand, with careful technique, a shadow capable of accurate interpretation may be forthcoming. Many of these pyelograms are quite good enough for diagnostic purposes. Relatively few of them allow of good production in print. The best shadows are never so intense as those obtainable with iodide solutions. The Americans use a Hickey bag to secure temporary compression over the bladder region. S. Lubash claims to secure much better visualisation in this way—at the expense of very little discomfort to the patient. Towards the same end the same writer lays stress on the value of withholding urination during the procedure.

Time to take the pyelograms.—It is recommended that pictures are to be taken at intervals of a quarter of an hour, three-quarters of an hour, and one and a quarter hours after the injection. The time at which the best pictures are possible may be fairly constant in the case of the normal kidney. In cases where functional activity is impaired the most intense shadows appear at very varying intervals. It is often necessary to continue the taking of plates at intervals for several hours before visualisation is possible. If this is so, the test becomes both tedious and expensive.

Results.

Since the excretion-rate of uroselectan is a measure of renal efficiency (or at any rate a measure of renal activity at the time), it is at once obvious that the method has its limitations. The absence of a shadow may indicate a derelict kidney (or even an absent kidney), but one may be left at a loss to know what process underlies the renal derangement. In many such cases a precise diagnosis was only possible when cystoscopy, ureteric catheterisation, and retrograde pyelography had been carried out.

Two cases of *polycystic disease* gave no shadow allowing of interpretation. The older method produced typical pictures at once. In one such case there was threatened uræmia with drowsiness, thirst, and a blood-urea figure of 160 mg. per 100 c.cm. No shadow resulted even with 60 g. of uroselectan. Also no untoward symptoms resulted from the injection, showing how free from toxicity the substance is.

Cases of *urinary tuberculosis* are usually investigated without recourse to pyelography. Good pyelograms, however, may be of great assistance in the diagnosis, and in three children with suspicious symptomatology perfectly clear visualisation of normal calices were obtained with 20 g. uroselectan. In this way valuable assistance in diagnosis was obtained without instrumentation. These shadows, though quite readable, were too faint to reproduce in print.

Abdominal swellings of uncertain nature: renal anomalies.—The kidney is all too frequently forgotten in the diagnosis of both the acute and the ordinary abdominal case. There is no need to emphasise the value of pyelography in the diagnosis of an obscure abdominal or pelvic swelling. Without instrumentation and with little disturbance to the patient an injection of uroselectan may clear up a difficult problem of diagnosis. Two such cases have been met with recently.

One presented a tender mass in the right iliac fossa extending downwards into the pelvis. The history was one of sudden acute generalised abdominal pain with vomiting, which had begun three days prior to admission. The temperature was raised and the pulse-rate rapid. Examination revealed a tender mass low down in the right iliac fossa. The clinical picture was very like that of an appendix abscess, but the surgeon was struck by the mobility of the tumour. An injection of uroselectan showed that the swelling was a peculiarly shaped ectopic kidney which had, of course, become infected.

The second case was that of a young women who complained of bouts of nausea, and who, on examination, presented a swelling crossing the mid-line just above the umbilicus. A provisional diagnosis of an anomalous kidney was made. Retrograde pyelography demonstrated a horseshoe kidney. With the advent of uroselectan, intravenous pyelography was carried out some time later. Besides the typical appearances of the pelves and calices the shadow of the whole organ was very clearly seen. The shadow was quite intense, and since the junctional band between the lower poles cast a shadow of equal intensity it was presumed that the kidneys were actually fused and not merely joined by a band of fibrous tissue as they often are.

Renal injuries.—A case was admitted with a history of loin injury and presenting a large tender mass in the region of the kidney. There was profuse hæmaturia. As is usual, an expectant attitude was adopted. After a few days uroselectan was given, and very good pyelograms showed that what damage there was did not involve the pelvis or the calices.

Renal calculi.—The treatment of many cases of renal calculus has been facilitated by this procedure. Patients with calculi presenting themselves in the out-patient department are sent up to the radiological department for intravenous pyelography. In many cases all the preoperative desiderata are obtained at once, since the pictures will demonstrate the presence and function of the supposedly sound kidney and the precise disposition of the stone or stones in the affected organ, and give a very good idea of its derangement and function. Such cases were taken into hospital and operative treatment meted out without delay and without instrumentation, to the saving of our hospital beds.

Hydronephrosis.—Out of eight cases of well-advanced hydronephrosis examined, only two failed to give a good shadow within a reasonable period after the injection. In spite of much enlargement of the pelvis and calices in the other six there was a surprising amount of active renal tissue left—too much to justify nephrectomy. There is much to be said in favour of the conservative treatment of hydronephrosis. Probably many useful kidneys are removed. If possible, the cause of the condition should be dealt with and the organ conserved. In point of fact, in this series of cases all but one had resulted from presence of calculi, which, of course, are always likely to recur in the same or in the other kidney, and the case for conservatism is thus very strong. Where destruction of the kidney had advanced

until little is left save a thin-walled sac, then only a very faint shadow (or even no shadow) is obtained. In such cases, if nephrectomy be deemed advisable, there is no question of removing an organ of value from the patient. The subsequent course and functional recovery of cases of hydronephrosis (and of pyonephrosis) has been followed by injections of uroselectan at intervals after conservative treatment.

Pyonephrosis.—In these cases it is unnecessary to stress the value of a method which allows of a demonstration of the presence and function of the "good kidney" without having to pass a catheter from a bladder containing pus.

Ureterograms.—Only very faint indications of the ureters are usually secured by the intravenous method, unless there happens to be some block in the ureter or unless temporary pressure is artificially secured by means of a Hickey bag or other device. One of the cases of largest hydronephrosis was due to a calculus impacted in the ureter two inches from the bladder. In this case there was a large hydroureter clearly indicated on the radiogram. Even in this case a good shadow was rapidly produced indicating the presence of much active renal tissue, and the treatment contemplated is simple removal of the stone. Uroselectan is most useful, of course, in this type of case. Retrograde pyelography may be impossible owing to the obstruction in the ureter. Uroselectan gives in a simple way a valuable picture of the condition present.

The *cystograms* obtained are good and are secured without the irritation sometimes observed with iodide solutions. The bladder soon collects enough uroselectan in solution to obscure the lower end of the ureter. This fact must be borne in mind when the examination is directed to this region.

Conclusions.

Where a cystoscope cannot be passed, or where ureteric catheterisation (or any instrumentation) is undesirable, difficult, or impossible, we have at our disposal an alternative method of visualising the renal pelvis and calices. In the presence of ureteric obstruction a clear ureterogram may be secured. The method may be of value in the investigation of the urological case in the child; in cases of severe cystitis—tuberculous or otherwise—where catheterisation is very difficult; in cases of profuse hæmaturia; in cases of urethral stricture and enlarged prostate; and in the subsequent examination of a kidney, the ureters of which have been transplanted.

The shadow cast by the excreting renal substance itself is enhanced during the excretory process, so that the size and shape of the kidney substance is often very clearly seen. The excretion-rate and the intensity of the pyelograms give a graphic representation of the function of each kidney at the time. This fact in itself may be valuable in dealing with certain cases such as hydronephrosis with blocked ureters. The excretion-rate, which represents the total renal efficiency at the time, may be ascertained by measuring the output in the urine, or more simply, by following the alterations in the specific gravity of the urine. This has not been found of much practical value. It is important in interpreting the results from the standpoint of function to bear in mind that the functional activity of a kidney can be *temporarily* inhibited, and the non-visualisation at a particular examination does not necessarily mean a permanently damaged kidney.

The method has its limitations, since the shadows depend on renal function, and therefore no shadow, or an undecipherable one, may be obtained in pathological renal conditions. To make a precise diagnosis, recourse to the older method may be necessary, and since in so many cases cystoscopy is absolutely essential it is still quicker (and cheaper) to proceed to ureteric catheterisation and retrograde pyelography in the average case.

Excretion urography is as yet somewhat expensive and uncertain. There must always needs be a percentage of failures, but undoubtedly a most valuable accessory investigatory method has been placed in the hands of the profession.

I am indebted to my chief, Prof. A. W. Sheen, for facilities to carry out these tests. I would thank Mr. Cornelius Griffiths and Mr. J. W. Geary Grant for allowing me to use some of their cases.

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"DUKE OF YORK HOME," BRADFORD.—On Thursday last week Princess Mary opened the first block of the new Bradford Infirmary, which is named after the Duke of York. The cost has been about £70,000, but the complete scheme of six blocks is estimated to cost £550,000, of which over £400,000 has been obtained. The present block is intended for paying patients, who will pay 4 guineas a week, and consists mainly of single-bedded rooms. At the opening ceremony Mr. George Priestman, the chairman of the hospital board, claimed that this is the first paying unit to be connected with a voluntary hospital outside London. The building has been erected with elaborate provisions for deadening sound and is warmed from concealed panels in the ceilings.

A BIRMINGHAM HOME FOR MENTAL DEFECTIVES.—On Tuesday last week Coleshill Hall, Warwickshire, which has been acquired by the Corporation of Birmingham, was formally opened as a home for mental defectives over the age of 16. The house and park of 180 acres, which were formerly the property of the Wingfield-Digby family, have been converted to their new purpose at a cost of about £89,000. Four "villas," each of which will hold 60 patients, have been erected in the park and, with the house itself, the colony will accommodate 300 cases—180 women and 120 men—but the arrangements will permit of the ultimate reception of 1000 patients. The large stables have been converted into a steam laundry and workshops have been erected in which carpentry, shoemaking, brushmaking, and other trades will be taught. At the opening ceremony the Lord Mayor of Birmingham expressed the hope that legislative action will eventually make it impossible for the mentally afflicted to have children.

CLINICAL AND LABORATORY NOTES

A CASE ILLUSTRATING THE VALUE OF AVERTIN IN UNUSUAL CIRCUMSTANCES.

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Circumstances do not often arise in which it is advisable to operate on a patient against his will and without his knowledge. It is perhaps worth while, therefore, to record a case in which these conditions were present and were met with so much success that the patient never knew that any operation had been performed on him, much less that his abdomen was opened and that a condition was dealt with which, unoperated on, must have led to death within a short period of time.

A man, aged 50, suffered from anomalous abdominal symptoms for weeks, but eventually showing signs of acute trouble underwent a laparotomy. A gangrenous appendix was removed. A week later there was a septic pulmonary embolus, followed by an abscess in the lung and expectoration of pus. The patient was by now very gravely ill and much reduced in weight, but the pulse remained strong and of good quality, and it was reasonable to hope that the lung trouble would be overcome in time and recovery eventually ensue. The abdominal wound was at this time still draining, but was closing up well.

However, fresh attacks of abdominal pain began and were accompanied by distension of the abdomen, rigidity, and a palpable mass in the left iliac fossa. It was obvious that unless surgery could relieve the abdominal condition recovery was very unlikely. The patient, however, was averse to any operation. His wife, a most intelligent woman, was certain that he would never consent and agreed at once that if an operation could nevertheless be performed that was the right course to pursue. I was asked to see the patient with a view to the possible safe use on him of avertin per rectum. In accordance with the views of his surgeon, Mr. L. E. Barrington-Ward, and Dr. Landale Clark, I explained to the patient that we desired to give him an enema which might have some effect on the bowel higher up. To this he consented. An injection of 4·5 c.cm. avertin in 180 c.cm. distilled water was slowly run in. The patient was encouraged not to object to any feeling of drowsiness that might arise, and he was assured that this was not unusual and betokened no danger. Within 10 minutes he was snoring gently. In half an hour's time Mr. Barrington-Ward opened the abdomen and found, after escape of some free fluid, a couple of coils of small intestine glued together and twisted on themselves with almost complete obstruction of the lumen. The bowel was nearly black but still glistening. A local short circuit was performed and the abdomen closed, and the patient carried back to bed about an hour after he had left it. During the first carrying from bed to operating theatre the patient had wakened up enough to moan at the pain of the lifting, although, of course, no consciousness had returned. During the operation 2½ drachms of C.E. mixture were used to facilitate closing of the peritoneum. Two hours after the time of beginning the operation the eye reflexes were brisk, and it was clear that the patient's state, as far as the anæsthetic was concerned, was one of safe recovery. Shock was not severe and was met by drip instillation of 5 per cent. glucose solution. During the evening and for 24 hours after the operation the patient slept off and on, took nourishment, and complained only of the pain he had experienced on the day before. There was no sickness or nausea. Owing to the daily dressings of the original appendix wound there was of course to him nothing unusual in the abdominal dressings that were carried out. He made no inquiries about what happened after his "enema." There was, as usual with avertin, an amnesia which wiped out time from the start of the injection to many hours after recovery.

Reviewing the facts of this case, the question arises whether any other method would have been possible. The only alternative I can think of is paraldehyde. No inhalation, of course, can be used without the patient's coöperation, and with any local or spinal method he would have realised the operation. A heavy doping with opiates would have been probably fatal to his chest condition. There remain only rectal methods, and of these ether can be ruled out because it would have been recognised and objected to in the early stages. Paraldehyde might have met the case equally well; it certainly could not have surpassed the result achieved with avertin.

THE LYSOZYME CONTENT OF SALIVA IN PSYCHOTICS.

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In his Arris and Gale lecture in 1929 Prof. Alexander Fleming[1] made reference to the discovery of a powerful antibacterial substance, lysozyme, which was present in normal human saliva in sufficient strength to cause, after diluting to 1 in 300, complete solution of a certain staphylococcus, *Micrococcus lysodeikticus* at 45° C. in one hour.

It has frequently been stated that infections of the nasopharynx and alimentary tract are common among patients suffering from mental disease, and causal significance has been attached to them by Cotton,[2] Ford Robertson,[3] and others. The following investigation was carried out to discover whether any corresponding alteration could be observed in the lysozyme content of the saliva of psychotics as compared with the normal. Every subject was investigated three times, over a period of six months, and as the lysozyme content in each case was found to be fairly constant, an average value was taken. The saliva was obtained at midday, centrifuged, to clear the fluid of solid matter, and tested at once. The criterion taken was the highest dilution of saliva giving rise to more than ⅞th lysis of standard buffered suspensions of *M. lysodeikticus* (two days growth on agar) in one hour at 37° C. This was found a convenient method for measuring the strength of lysozyme present. The degree of lysis was judged by comparision with tubes containing barium sulphate suspensions of standard opacity. The following results were obtained:—

Highest Dilution of Saliva Giving Standard Amount of Lysis.

Average of—	
6 normal controls	1/292
8 cases of dementia præcox	1/267
4 mental defectives	1/242
4 cases of mania	1/211
4 ,, post-encephalitic parkinsonism	1/128
6 ,, general paralysis	1/89

No relation between the titre of lysozyme and age could be demonstrated. The actual quantity of saliva secreted was not found to be an important factor. In the above series some of the cases of dementia præcox were very vigorous dribblers like the post-encephalitics. A series of data taken comparing the lysozyme content with the quantity of saliva obtained in three minutes makes this point clear.

Less than 0·5 c.cm. collected (average of 30 tests), titre of lysozyme measured as above	1/144
More than 0·5 c.cm. collected (average of 23 tests), titre of lysozyme	1/172

Males have, as a rule, a slightly lower titre than females (about 20 per cent. less); this is possibly due to the habit of smoking which seems to cause

[1] Fleming, A.: THE LANCET, 1929, i., 217.
[2] Cotton, H. A.: Jour. Ment. Sci., 1923, clxiv., 329.
[3] Robertson, W. M. F.: Jour. Ment. Sci., 1922, lxviii., 8.

secretion of watery saliva. For example, the figures for the four male cases of G.P.I. were 1/117, 1/53, 1/50, 1/117, and those for two female cases were 1/133 and 1/67.

The figures quoted suggest that there is no significant difference between the normals, mental defectives, and cases of dementia præcox with regard to the lysozyme content of saliva, but that in organic psychoses, such as G.P.I. and parkinsonism, the concentration is much diminished. The diminution of lysozyme content appeared connected with a generally weak physical state and low resistance to infection. It is interesting to note that the lysozyme content was uniformly low in parkinsonism, where the infection is supposed to travel via the saliva.

My thanks are due to Dr. M. Penrose for her help and to the Medical Research Council for financial assistance.

ADJUVANTS TO THE MALARIAL TREATMENT OF GENERAL PARALYSIS.

By John H. Ewen, M.R.C.S. Eng., D.P.M.,

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Most authorities agree that, in order to obtain the best results from the malarial treatment of general paralysis of the insane, it is essential to supplement this line of treatment by a course of antisyphilitic remedies. It is not always easy to decide between the rival claims of the various antisyphilitic preparations obtainable, especially in relation to the malaria-infected subject. In four of the following five cases a different antisyphilitic therapeutic agent was used, while all the cases had exactly the same routine malarial treatment. Blood inoculation (5 c.cm.) was employed in every case, and eight to twelve rigors allowed, while throughout the course ℿx. of cardiazol (Knoll) were given thrice daily.

THE CASES DESCRIBED.

Case 1. *Novarsenobillon.*—Male, aged 48. Mental condition before treatment: excited and grandiose; restless and emotional; noisy, destructive, and impulsively violent. Wet and dirty in his habits and confined to bed. A typical case of the classical type. Physical condition: fat and flabby.

Six intravenous injections of novarsenobillon 0·6 g. were given before the malaria inoculation and six after the last rigor.

Mental condition after treatment: quiet and well-behaved; clean in his habits; while his delusions of grandeur persist, they are not so prominent. He is up and about and does a little ward work. Much improved physically.

Case 2. *Bismògenol.*—Male, aged 44. Mental condition before treatment: hypochondriacal delusions and auditory and visual hallucinations; cerebration very slow; confused and at times incoherent. Physical condition: fair.

Sixteen intramuscular injections of 2 c.cm. bismogenol (Tosse) were given before malaria treatment.

Mental condition after treatment: hypochondriacal delusions in abeyance; still hallucinated; on the whole no real mental improvement. Physical health much improved.

Case 3. *Mesurol.*—Male, aged 33. Mental condition before treatment: exalted and egotistical; marked euphoria; excited, restless, and impulsively violent; greatly lacking in insight and full of foolish schemes for money-making. Physical condition: thin and in poor health, with a marked facial tremor.

Eight intramuscular injections of 1 c.cm. mesurol were given before malaria treatment and two injections after the last rigor.

Mental condition after treatment: a marked and definite improvement; quiet and well-behaved and occupies his time usefully; well orientated and in touch with reality. Physically much improved, and has gained over a stone in weight. Facial tremor practically gone.

Case 4. *Tryparsamide.*—Male, aged 49. Mental condition before treatment: typical delusions of rank and wealth; restless, destructive, and excited; exceedingly talkative, with no emotional control. Wet and dirty in his habits and confined to bed. Physical condition: very poor.

Six intravenous injections of 3 g. tryparsamide were given after the last rigor.

Mental condition following treatment: a definite improvement; quiet and well-behaved; no evidence of any delusions; converses rationally concerning his illness, and shows insight and emotional control. Habits clean. Physically: very much improved.

Case 5. *Malaria treatment alone.*—Male, aged 56. Mental condition before treatment: grandiose and religious delusions; auditory hallucinations; noisy, restless, and incoherent. Wet and dirty and confined to bed. Physical condition: marked cardiovascular degeneration.

After malaria treatment he became quieter and better behaved, with some improvement in his habits, but his mental condition is totally unchanged. The malaria does not appear to have affected his physical condition.

CONCLUSIONS.

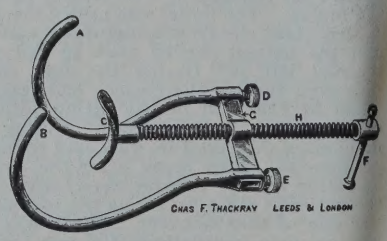
The best result was that obtained from the use of mesurol, but undoubtedly the age of the patient was a prominent factor. Tryparsamide gave a definite improvement with no subjective symptoms, while a promising change for the better was obtained through novarsenobillon. Neither bismogenol nor malaria therapy by itself gave encouraging mental results, although the physical health was improved: All the cases remained Wassermann-fast, and there were no material changes in the cerebro-spinal fluid after treatment. The physical signs in the main persisted.

I am indebted to Dr. P. C. Coombes, medical superintendent of Netherne Mental Hospital, for permission to publish these notes.

NEW INVENTIONS

OSTEOCLAST WITH SCREW CONTROL.

The accompanying figure illustrates an osteoclast the pattern of which is founded on the ordinary steel rail bender. I have had the instrument in use for a considerable time, and am satisfied with its performance. In attempting to straighten deformed bones, to move stiff joints, or to correct such a condition as talipes, manual efforts are futile and exhausting, as so much energy is dissipated in controlling the corrective force. With the screw adjustment (H) the amount of force available is very great, and yet is strictly under control—which is not the case with the lever osteoclast in general use. To minimise injury to the tissues the resisting arms (A and B) and the plunger (C) are encased in thick rubber tubing (supplemented when required with sponge rubber or wool). Less damage to the soft parts results if the pressure is rapidly applied, and the tension removed in a short while by unwinding the screw. The arms (A and B) are adjustable on the bar (G) by the screws (D and E) so that curves of various diameter may be treated. The bar (F) slides in its sockets, so that extra leverage may be applied to the screwed plunger (H). Messrs. C. F. Thackray, Regent-street, London, W., are the makers.



Alexander MacLennan, M.B., C.M. Glasg.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN WINNIPEG.

(*Continued from p. 641.*)

SECTION OF ANÆSTHESIA.

THIS Section met under the presidency of Dr. R. E. APPERLEY (London). At the first session a paper on anæsthesia for

Operations on the Gravid Uterus

was read by Dr. H. W. FEATHERSTONE (Birmingham). A wide choice of methods, he said, was available for anæsthesia in these cases, and thus the anæsthetist could help the obstetrician to guard the pregnant woman against the dangers of her pregnancy. He confined his remarks to those operations normally undertaken to improve the course of pregnancy, or to make unobstructed labour possible. Muscular relaxation and freedom from congestion were necessary, and ether, ether-chloroform mixtures, or spinal anæsthesia gave excellent results. Manipulation of the fœtus in utero required, as a rule, only light and non-toxic anæsthesia, such as that produced by nitrous oxide and oxygen. In general, chloroform was the most useful for labour; it was safe and convenient for midwifery practised outside hospitals. The lightest anæsthesia—just a dreamy sleep or amnesia—should be aimed at, with deepening of anæsthesia for application of forceps. Ether was safe but pungent for the patient. Avertin was the most pleasant anæsthetic, but it prolonged labour, and the duration of its effect was limited. In his opinion, nitrous oxide oxygen was the most satisfactory anæsthetic; a special anæsthetist, however, was necessary, and the heavy weight of the apparatus tended to limit its employment to hospitals and similar institutions.

For evacuation of the uterus and for Cæsarean section, Dr. Featherstone, in conjunction with Prof. Beckwith Whitehouse, had found that spinal analgesia, on account of the strong, continuous contraction of the uterus which it produces, was safe and valuable. He presented an analysis of 100 cases of Cæsarean section performed under spinal analgesia. The loss of blood was remarkably small, the fœtus was lively and free from embarrassment, and the suture line could be inserted firmly. The mothers were all questioned by a recent postal inquiry, and without exception they expressed complete satisfaction. In the attempt to ensure an active child preoperative sedatives were withheld, but nitrous oxide oxygen was frequently administered in addition to the spinal analgesic. Hysterectomy of the gravid uterus in the later stages of pregnancy, usually for toxic concealed accidental hæmorrhage, was an extremely serious operation, and nitrous oxide oxygen anæsthesia gave the best hope of success.

ADVANTAGES OF NITROUS OXIDE.

Dr. SAMUEL JOHNSTON (Toronto) thought nitrous oxide and oxygen was the most valuable anæsthetic for operations on the gravid uterus. In instrumental delivery he always administered an extra amount of oxygen immediately before the birth of the child. His experience was that toxic patients and those suffering from eclampsia, chronic nephritis, and myocarditis had the highest mortality-rate. He regarded chloroform as a dangerous drug, and in no circumstances would he allow a patient to administer chloroform or any other anæsthetic agent to herself. If he were handicapped and had no assistance whatever, he would first administer the anæsthetic himself and then deliver the patient. He preferred ether to chloroform because it was safer, and because anæsthesia was more prolonged. He had used spinal analgesia in selected cases and had found it very satisfactory for diabetics and where goitre obstructed respiration. He did not advocate its employment in cardiac conditions because the drop in blood pressure made it very dangerous. Recently he had obtained satisfactory results from the employment of sodium amytal as a sedative before anæsthesia.

Prof. W. WEBSTER (Winnipeg) said that the best anæsthetic agent for these conditions was one which was rapidly absorbed and rapidly excreted, and the best available were ethylene and nitrous oxide. The use of one of these as an analgesic was probably ideal. His objection to spinal analgesia was that it was accompanied by a contraction of the circular muscle of the uterus which was apt to delay labour.

Dr. M. E. BOTSFORD (San Francisco) regarded a nitrous oxide-oxygen mixture as safest. She did not employ preoperative medication because she considered that it had a deleterious effect upon the child. She used ether in addition if labour was prolonged, but the mother was flooded with oxygen immediately before delivery. The use of sodium amytal was attended with good results to the mother, the condition produced resembling scopolamine-morphine narcosis, but the child had often died.

SAFETY OF CHLOROFORM.

Dr. DAVID LAMB (Glasgow) spoke of the difference between the practice of midwifery in England and in North America. In England, where much domestic midwifery was performed, the administration of nitrous oxide was attended with difficulties which did not apply to hospital practice. For these cases small whiffs of chloroform were given. This was perfectly safe and perfectly effective.

Dr. R. WATERS (Madison, Wis.) said that in rural U.S.A. most women were delivered under chloroform anæsthesia with a feeling of assurance. He disagreed with Dr. Johnston's statement that the anæsthetic agent was the most important factor; in his opinion the anæsthetist was. He considered that spinal anæsthesia should be accompanied by oxygen and carbon dioxide administered by inhalation, because this tended to retain correct alveolar balance.

Dr. J. S. LUNDY (Rochester, Minn.) said that it had recently been shown that chloroform had very little effect upon newly formed liver as contrasted with old. This probably accounted for the innocuousness of the agent when used in labour. He had frequently seen protracted headache, diplopia, and even foot-drop after spinal anæsthesia.

The PRESIDENT commented upon Dr. Lundy's statement regarding the effect of chloroform upon young liver. Some years ago he investigated the effect of this drug upon the liver, and he found that this organ was damaged more in some cases than in others. He felt that Dr. Lundy had supplied the explanation. Whenever possible he used nitrous oxide and oxygen for the type of case under discussion, but he preferred spinal analgesia for those complicated with cardiac disease.

Endotracheal Anæsthesia.

Dr. I. W. MAGILL (London), in a paper on Technique in Endotracheal Anæsthesia, said it was only recently that this form of anæsthesia had been regarded as within the normal routine of the operating theatre. Its advantages were now widely known and, in

England, many expert anæsthetists now employed the method for operations which formerly bristled with anæsthetic difficulties. In some quarters, however, endotracheal anæsthesia was either not available or its administration was attended with unfavourable results; he attributed this to the fact that many anæsthetists would not trouble to master the technique of intubation. The method had many advantages; the airway was free under all conditions, the patient was protected against the entry of blood into the trachea, the surgeon was protected from anæsthetic-laden exhalations, and, because the larynx was under control, it was possible to maintain a light and even anæsthesia. The fundamental principle of the method was the provision of an airway that was practically proof against obstruction. Dr Magill said that, in his opinion, with the exception of those operations in which positive pulmonary ventilation was essential to life, low pressure or no pressure gave adequate results. He stressed the importance of the correct position of the patient's head for intubation. Hyperextension usually augmented the difficulty of the procedure; the head should bear the same relation to the neck and trunk as obtained in the erect position. If a curved rubber tube was now passed into the nostril it would naturally enter the glottis, but if it was passed through the mouth it would almost always enter the œsophagus. When intubating through the mouth he preferred to pass the tube by direct vision with the aid of a speculum. This was easily done under deep anæsthesia such as was obtainable with ether, but it could be done quite easily under light anæsthesia if the pharynx and vocal cords were cocainised before or during induction with a fine nebuliser. This diminished the tendency to reflex contraction of the pharyngeal muscles.

Dr. Magill described a method of blind intubation through the nose, which he regarded as most valuable. It could be performed under light anæsthesia without risk of damage to the teeth or to growths. A piece of curved commercial rubber tubing about ten inches long and $\frac{3}{8}$ inch in calibre was passed through one nostril and the end, which was cut obliquely, was passed into the larynx. This manœuvre was quite easy. A wide tube was used in order to maintain free to-and-fro respiration, and thus it was unnecessary to administer the anæsthetic under high pressure or to pass an expiratory tube. Anæsthesia could be maintained on ordinary inhalation principles, and the system could be open or closed. Low pressure was used as routine, but ample high pressure was available immediately in case of any emergency. In every case the pharynx was packed with gauze to ensure that respiration took place through the nose, and in order to prevent blood from reaching the trachea. Dr. Magill stated that this method was quite satisfactory for children, a smaller tube, of course, being employed.

DISCUSSION.

Dr. WATERS wondered if Dr. Magill had used excess of carbon dioxide in order to separate the vocal cords, and also if he employed morphine or any other premedicament. He did not like the two-tube method because there was a tendency to wash CO_2 out of the body. Like Dr. Magill, he preferred the single tube method; he used a thinner-walled tube than that which had been described. He did not pack the pharynx, but he used a special form of inflatable cuff, which was slipped over the tube.

Dr. R. HARGRAVE (Toronto) said he had never used nasal intubation. He inquired if Dr. Magill passed a tube through both nostrils or whether he only used one nostril. He asked if there was any difficulty regarding preliminary cocainisation.

Dr. J. A. BLEZARD (Edmonton, Alberta) inquired if nitrous oxide produced sufficiently deep anæsthesia for intubation.

Dr. S. JOHNSTON (Toronto) wondered if endotracheal anæsthesia was as safe as had been supposed. He described a case in which sudden cyanosis and death occurred during the endotracheal administration of nitrous oxide and oxygen. The lungs were inflated with oxygen without effect.

Dr. HAYES (Christchurch, New Zealand) asked if Dr. Magill interrupted the flow of gases; also at what stage the tube was removed.

Dr. E. I. MCKESSON (Toledo) believed that nasal intubation had a great future. He once devised a straight tube for its performance; this was not a success; like Dr. Magill's tube it should have been curved. He agreed that the anæsthetist should endeavour to visualise the tip of the catheter. There was plenty of room for improvement in the technique of administration of endotracheal anæsthetics in America.

Dr. LUNDY said that dexterity was the main requirement in passing a nasal tube. He always used a water manometer in connexion with the tube. He believed that sudden pressure on the posterior pharyngeal wall was not devoid of risk; some years ago a patient suddenly died during examination of the naso-pharynx, and death was attributed to this.

Dr. FEATHERSTONE asked if there was any risk of tracheitis. When the tube, in error, was passed into the œsophagus, and the anæsthetic was blown into the alimentary tract, there was the danger of rupturing the wall of a viscus.

Dr. BOTSFORD asked the indications for endotracheal anæsthesia. She described a method of passing the tube indirectly over a stilette, without the aid of a speculum.

Dr. H. SHIELDS (Toronto) was impressed by the simplicity of Dr. Magill's method and by their adaptability for oral and pharyngeal operations. He asked for further information regarding the use of the method in children.

In reply, Dr. MAGILL said he often employed CO_2 to widen the vocal cords. He also premedicated with morphine, hyoscine, or paraldehyde. He did not hesitate to deliver the gas under pressure; neither did he hesitate to use cocaine, for surgeons used it without risk for minor operations about the nose and throat. He had cocainised young children. He liked to have an active cough reflex before withdrawing the tube. There was no reason why two tubes should not be used—one for each nostril. Tracheitis could be prevented if the tubes were well lubricated with sterile paraffin.

Post-operative Pulmonary Complications.

At the second session the chair was occupied by Prof. W. WEBSTER (Winnipeg), Vice-President, and Dr. D. C. AIKENHEAD (Winnipeg) read a paper on Post-operative Respiratory Complications during a Four-Year Period. He analysed the lung complications following 33,066 operations performed during the years 1926–29. Of these, 31,301 were performed under general anæsthesia, while the remainder were under some form of local anæsthesia. According to the records there were 55 cases with respiratory complications with 23 deaths.

Dr. Aikenhead detailed the preoperative routine for these patients. Perhaps 65 per cent. would receive morphine sulphate gr. $\frac{1}{6}$ with atropine sulphate

gr. 1/150. Operation was postponed in patients with coryza or with a history of respiratory trouble. Over half the series received open ether, and approximately one-sixth received nitrous oxide or ethylene. Operations performed included all types and the age limits were four days to 90 years. Of the 55 respiratory complications, 13 were of a minor nature, while the remaining 42 were pneumonic processes. Of these 42, 19 cases had gross sepsis present at operation and 14 (or 73 per cent.) died. The incidence of respiratory complications was approximately equal for both sexes, while each decade over 40 added to the risk. A curious feature was that gas anæsthesia carried a higher rate of pulmonary complications than ether, probably because this was the anæsthetic of choice in handicapped patients. Dr. Aikenhead considered that the splinting of the abdominal muscles by pain and tight binders predisposed to circulatory stasis in the bases of the lungs. Infection tracked up to this area of stasis through the diaphragm via the lymphatics. He concluded that a post-operative respiratory complication was a serious hazard to recovery, but that, taking into consideration the number and gravity of modern surgical procedures, pulmonary complications followed operations less frequently than might be expected. Gross sepsis at the time of operation predisposed to post-operative pneumonia, but the careful selection of patients for operation with equal attention in the after-care could minimise the risk of a respiratory lesion until such time as a more definite cause for this complication is known.

The PRESIDENT (Dr. Apperley) congratulated Dr. Aikenhead upon his paper and upon the magnitude of his figures. In 22 years he had given 37,000 anæsthetics to patients varying in age from 18 hours to 96 years. In the old days, it was not uncommon to see a mild form of post-operative pneumonia which was abolished largely by the introduction of atropine. The routine in England was to premedicate all patients with atropine gr. 1/100, and this reduced post-operative respiratory complications except, perhaps, in upper abdominal operations. He had observed that nose and throat operations were singularly free from these complications, and he held the view that the inhalation of septic material was not, in itself, a cause of respiratory complications. With the possible exception of radical hysterectomy, pelvic cases were almost always free from these complications, and he considered that this reduction was due to the introduction of spinal anæsthesia, which reduced the time the patient was upon the table. In his experience, operations upon the upper abdomen were those most commonly followed by respiratory complications. He concluded that there was no routine method for prevention, but that each case must be considered individually.

Dr. F. J. G. LA FLECHE (Winnipeg) said that lung complications should be regarded as post-operative rather than post-anæsthetic. Incidence was due to many factors: the patient's preoperative condition, premedication, the site of operation, the handling of the tissues, the kind of anæsthetic, the interference with the respiratory and circulatory functions, the reduction of vital capacity following operations, and the post-operative care. All these factors combine to reduce the patient's vitality, so that latent respiratory infections might develop into serious trouble. The use of CO_2 and O_2 would more thoroughly help to prevent atelectasis and stasis.

Dr. FEATHERSTONE said some years ago he analysed 4 different ætiological factors for post-operative pulmonary complications. He considered that upper abdominal operations, shock, and infection were the most important factors. Including terminal pneumonia, the pneumonia-rate was about 1 per cent. of all surgical procedures, but his impression was that it is now less common than ten years ago. At the end of the war, the incidence of these complications rose markedly in Vienna, probably because of defective nutrition.

Dr. LAMB said some years ago he analysed a series of post-mortem reports and, in every case of post-operative pneumonia, there was an associated septic condition. There was extreme danger in operating upon a patient with coryza. Dr. Lamb referred to the frequency of lung abscess following tonsillectomy in America as contrasted with the infrequency of this condition in England.

Dr. JOHNSTON said the probable explanation of Dr. Lamb's observation was that tonsillectomy was usually performed in the recumbent position in England and in the sitting position in America.

Dr. BOTSFORD stressed the importance of eradicating all throat infections before submitting the patient to operation. She had found that respiratory complications were reduced when tonsillectomy was performed under nitrous oxide and oxygen. Although chloroform was dangerous for the heart, it was safer than ether for the lungs.

Prof. WEBSTER described the "leaning forward" position for tonsillectomy; the recumbent position was adopted for this operation in Winnipeg. He considered the depth of anæsthesia to be an important factor in respiratory complications; inhalation of pus and blood occurred when anæsthesia was sufficiently deep to relax the soft palate. These complications were very frequent when tonsillectomy was performed under local anæsthesia.

Dr. MCKESSON did not consider the anæsthetic or the position exclusively responsible for respiratory complications. Many factors were concerned. He had given 1000 nitrous oxide and oxygen anæsthetics for tonsillectomy with only one lung abscess; this occurred in the practice of a surgeon who demanded deep anæsthesia and got it. In tonsillectomy the patient should be kept light and the airway free.

Dr. BLEZARD had a great regard for atropine, and felt that it might be used post-operatively.

Dr. HAYES said that in New Zealand he had never seen a lung abscess after tonsillectomy.

In reply, Dr. AIKENHEAD said that in North America there were a great many cases of sinus infection which, no doubt, predisposed to respiratory infection. He agreed that adequate preoperative medication was essential.

Sodium Amytal.

Dr. L. G. ZERFAS (Indianapolis) read a paper on Sodium Amytal. This drug, he said, which chemically was sodium iso-amyl-ethyl barbituric acid had, in common with other barbiturates, hypnotic properties; The barbiturates, however, differed largely as to toxicity, rate, and manner of elimination. The therapeutic margin of safety had been determined for a great many of these compounds, and it had been found that it was, approximately, in proportion to the fatal dose. Amytal was rapidly and completely destroyed in the body, for no trace of the drug or its decomposition products could be demonstrated in the urine after intravenous administration. No investigations had yet been made concerning the possible excretion of the drug in the fæces, its content in the body tissues, or its rate of disappearance from the blood stream. Amytal had little or no effect upon metabolism;

carbohydrate metabolism was not affected in the same chaotic manner as by ether, and it had been shown that sodium amytal prevented the hyperglycæmia which normally followed the injection of morphine in dogs. The intravenous injection of sub-lethal doses of sodium amytal produced an alarming fall of blood pressure if the drug was given rapidly. Not more than one grain should be injected per minute. The average systolic fall in man after normal injections was 30 mm. Hg. Patients with hypertension suffered a greater proportionate decrease. In animals toxic doses of sodium amytal usually caused death by respiratory failure; with normal doses, however, the respirations were reduced in amplitude, but their regularity was maintained. After the intravenous introduction of grs. 3 to 9 to man drowsiness and profound sleep came on quickly. The corneal reflex was diminished, but the gag reflex remained. Unconsciousness lasted three to six hours.

Dr. Zerfas felt that it was safer to use sodium amytal by the oral or rectal routes rather than intravenously. There was no fixed rule for dosage. He regarded grs. 15 as the maximum dose. There was ample evidence that sodium amytal was useful as a pre-anæsthetic hypnotic; but it should not be regarded as an anæsthetic agent.

Dr. LUNDY said he regarded the oral dose of sodium amytal as grs. 16 to 45. Larger doses were toxic to the patient. He had seen grs. 3 per hour given to a patient with convulsions for several months. Altogether, grs. 9000 were administered without toxic manifestations. The exhibition of sodium amytal was contra-indicated in comatose cases. In common with other barbiturates, toxic doses caused acute pulmonary œdema which was best treated with intravenous hypertonic glucose solution and an oxygen tent. In some cases sodium amytal produced excitement instead of narcosis; this was probably due to the production of isomers which possessed a different effect. He considered that sodium amytal should be regarded as an hypnotic rather than as an anæsthetic.

Dr. BOTSFORD described the effects of sodium amytal upon a series of children. She stressed the fact that it abolished the dread of operation with its subsequent production of various mental complexes. The use of premedicaments such as sodium amytal tended to abolish fear; in addition, it rendered possible the use of much smaller quantities of inhalation anæsthetic. She administered the drug orally in capsules. She concluded that sodium amytal could safely be given to children; that it was more effective than opium in abolishing fear; and that the minimal effective dose should be administered by mouth.

Dr. MOORE (Grand Forks, N. Dakota) described good effects from the use of sodium amytal in obstetrical work. He administered the drug by intramuscular injection and labour, or even a low forceps delivery could be conducted without the use of any other anæsthetic. In no case had the patient complained of after-pains, and, in reply to Dr. Featherstone (Birmingham), Dr. Moore stated that he had observed no untoward effect upon the child.

Dr. BLEZARD also described good results from the use of sodium amytal in labour. The drug appeared to relax the cervix.

Dr. F. B. PARSONS (Cambridge) maintained that sodium amytal and, indeed, all so-called non-volatile anæsthetics, should be regarded as premedicaments, and not as anæsthetics. It was impossible to control the action of these drugs upon a patient, and for this reason he expressed the view that future developments would take place in the direction of the better administration of inhalation anæsthetics. The dosage of sodium amytal appeared unsatisfactory; he had heard recommended doses of from grs. 3 to grs. 45 for an adult patient. This has rather a large range for a barbiturate.

In reply Dr. ZERFAS said that sodium amytal and other non-volatile anæsthetics should not be used in routine fashion. They were valuable, however, for those patients who were psychically disturbed at the thought of an inhalation anæsthetic.

SECTIONS OF RADIOLOGY AND OTO-LARYNGOLOGY.

AT a combined meeting of these Sections, Sir STCLAIR THOMSON being in the chair, a discussion on the

Mechanism of Swallowing

was opened by Dr. A. E. BARCLAY (Cambridge), who gave an account of the observed mechanism of swallowing. All the evidence, he thought, pointed to the fact that the bolus of food was carried from the back of the tongue down the œsophagus as far as the clavicular level by negative pressure. He showed photographs of food passing down the first part of the œsophagus. The fact that the bolus was in no way compressed showed there was no pressure from behind. The negative pressure in the pharynx was produced by a combined raising of the larynx and backward movement of the tongue, which together obliterated the pharyngeal space for a fraction of a second. With mouth, nose, and larynx closed, the reopening of the pharynx produced a negative pressure that was largely responsible for the act of swallowing. Except for fluids, gravity played a minor part in the normal act. The larynx was cut off, not by a movement of the epiglottis or of the laryngeal margin, but by a dragging up of the laryngeal pharynx behind the larynx to touch the epiglottis not far below its tip. He summed up the phases of swallowing as follows:—

1. The mouth and nose are closed.
2. The larynx is raised and closed and its upper part is obliterated by the back of the tongue.
3. The pharyngeal space is obliterated by (*a*) raising the larynx; (*b*) retraction of the tongue. (The posterior wall of the pharynx does not come forward—the pharynx is not constricted, but is compressed from before backwards against the posterior wall—i.e., against the vertebræ.)
4. The pharynx is opened up and with the three outlets closed a negative pressure is obtained by (*a*) dropping the larynx; (*b*) allowing the tongue to go forward.
5. During this movement the laryngeal pharynx still remains high up, in close relation to the epiglottis. It is in an opened-mouth condition.
6. Food is tipped over the back of the tongue.
7. Food is sucked into the open mouth of the laryngeal pharynx, which, as it receives the bolus, drops from the epiglottis down to its normal position, thus opening up the larynx again, after the food has passed.
8. The food is probably sucked some distance down the œsophagus.

Dr. L. J. CARTER (Brandon) remarked on the difficulties of investigation owing to the exceedingly short space of time occupied by the act of swallowing. Dr. Barclay's work illustrated the value of serial radiography.

Mr. E. D. D. DAVIS (London) said that the epiglottis could be removed without causing a patient difficulty in swallowing. It was the vestige of a structure designed to direct the air current into the nasal pharynx and had become modified for the production of speech. Swallowing was a combination of negative

air pressure and muscular action; this was shown by the inability to swallow when the muscles of the pharynx were paralysed.

Benign Gastric Tumours.

In opening the discussion on this subject Dr. W. H. DICKSON (Toronto) gave a résumé of the types of benign tumours found in the stomach, beginning with the different gastric polypi. Single tumours included myomas, fibromas, neurocytomas, angiomas, and lipomas. In all these cases there was no marked induration to be felt; the stomach should always be palpated during the screening. Syphilitic conditions were found not uncommonly at operation, although not nearly so often as malignant diseases.

Dr. BERNARD MOONEY (Edmonton) said he had looked up records of the four general hospitals in Edmonton. After excluding inflammatory masses of a syphilitic character and those due to ulcer, no single cases of benign gastric tumour remained. The rarity of the condition was also borne out by the published statistics of James Douglas. The only case in his own experience was that of a simple fibroma removed from the duodenum, which had a pedicle extending up through the pylorus.

X Ray Diagnosis in Medico-Legal Cases.

Dr. A. HOWARD PIRIE (Montreal) described the pitfalls into which the practitioner might fall in giving evidence before the courts, and showed by lantern slides how easy it was to mistake an abnormal bone or the abnormal development of a bone for a fracture. Such abnormalities being frequently bilateral were shown up by taking a skiagram of the opposite side. He gave a useful table of the average number of days necessary for convalescence following fracture of various parts of the body.

Dr. E. E. SHEPLEY (Saskatoon) said it was advisable to secure plates immediately in all cases of accident, for a slight trauma was sometimes sufficient to activate a quiescent pathological condition, such as osteo-arthritis. In this way employers of labour were frequently held responsible for conditions alleged to have been caused by serious injury when in reality the disability was already existing in a dormant state at the time of the accident.

Dr. FRANK A. SMITH (Winnipeg) thought the interpretation of skiagrams should be left to medical men skilled in radiology.

X Ray Therapy.

Prof. J. E. GENDREAU (Montreal) dealt with the possibilities of high power X ray therapy. He showed slides of a tube constructed to withstand 900 kilo-volts; this could only be employed in a laboratory, but it was possible to use tubes for therapeutic purposes which would withstand 350 kilo-volts. With such a tube the average wave-length was more penetrating than the maximum penetration given by a tube with 250 kilo-volts. He believed that more powerful tubes would soon be in use for therapy, even up to 600 kilo-volts.

Radium in Cancer Therapy.

Dr. DOUGLAS QUICK (New York) surveyed the present use of radium in cancer therapy and its relation to operative surgery and X ray therapy. Accurate application and adequate dosage were essential for effective treatment, and he outlined the work being done at the Memorial Hospital to estimate dosage more exactly. The relative radio-sensitivity of the tumour as determined by careful histological studies should, he said, be taken into account when irradiating it.

Prof. JAMES EWING (New York) said he was hoping for improvement in another direction—namely, by increasing the radio-sensitivity of tumours, e.g., by the injection of heavy metals. In some tumours the object of treatment was to destroy the malignant cell; in others, especially where there was a large mass of tissue, beneficial results might be due to a change in the character of the cell which deprived it of its malignant characteristics.

IN MENORRHAGIA.

Dr. MALCOLM DONALDSON (London) spoke of the importance of radiotherapy in non-malignant conditions, especially for the distressing attacks of irregular hæmorrhage associated with the onset of the menopause. It was, of course, essential to exclude malignant disease before attempting to treat such a case. In the case of irregular hæmorrhage an exact diagnosis could only be made after exploration of the uterus under an anæsthetic. In the case of a woman over 40 years of age, the advantages of radiotherapy far outweighed the disadvantages; in young women the problem was not so simple. It was true that in a certain number of them radium or X ray treatment given in small doses had restored the menstrual cycle to normal and diminished the amount of loss. The risk of producing a permanent amenorrhœa with the accompanying symptoms of the menopause was, however, too great to justify such treatment in young women, and he preferred hysterectomy. Radium, he thought, acted on the ovaries rather than on the endometrium. He advocated radiotherapy for fibroids not larger than a fist when the patient had reached the age of 40. In patients over that age practically every case was cured.

Dr. E. W. PROUD (Vancouver) said he had got satisfactory results with smaller doses than those used by Dr. Donaldson.

IN EPITHELIOMA OF THE SKIN.

Dr. W. ROY WARD (London) dealt mainly with basal-celled epithelioma, and touched only briefly on squamous epithelioma, as the treatment of the latter was surgical. Radium, he said, was undoubtedly the best treatment in most cases of rodent ulcer; cosmetically, it gave results which could not be obtained by any other method. On an analysis of nearly 1800 consecutive cases treated at the Radium Institute of patients whose lesions had become refractory to previous X ray treatment nearly half were healed as the result of radium therapy. Occasionally an undoubted basal-celled growth took on the characteristics of a squamous-celled epithelioma; more than half of these cases were situated in the neighbourhood of the ear. In squamous epitheliomata of the skin the results of excision were so good that radium should be reserved for the more extensive cases or those in which operation was contra-indicated. The treatment of the primary lesion was usually satisfactory; prophylactic irradiation of the neighbouring lymphatic areas was of doubtful value. When the glands were definitely invaded, the immediate result was often encouraging, but the permanent disappearance of infected glands was exceptional.

Dr. PIRIE said that in his own practice X rays had proved as efficient as radium, and the treatment only lasted three minutes.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

THIS Section met under the presidency of Mr. COMYNS BERKELEY (London), and at its first session a paper on

Radium in Gynæcology

was read by Dr. SIDNEY FORSDIKE (London). It was urgently necessary to decide, he said, how radium acts—whether on cell or stroma. While histology showed the change of structure in a tissue after irradiation, it told nothing of why the change occurs. He pleaded strongly that some of the radium at present being provided for clinical research should be devoted to the equally important field of biological investigation. In his own opinion the primary action was on the stroma and the cell changes were only secondary, but further investigation was needed, for it was only by full understanding of this problem that dosage and methods of application could be placed on a scientific basis. The marked divergence of views on screens, split dosage, and treatment of glands demonstrated the present uncertainty.

Whatever its effect on cancer, there was no denying the value of radium in producing an artificial menopause. Even here, however, there were differences of opinion about dosage, and whether the endometrium or the ovaries are affected. Recently, he had himself been using a dosage of 53 mg. radium element screened by 1 mm. of platinum for 22 hours, and had observed satisfactory results. In his opinion there was no doubt that the ovaries were unaffected, and that all the results arose from the action of radium on the endometrium. Except in very rare cases he did not advocate the use of radium in the treatment of fibroids.

Dr. Forsdike reported his results in treating 181 cases of carcinoma of the cervix from 1921–25 as follows: inoperable cases, 134, alleviation and prolongation of life, but no cure; borderline cases 33, four cured; operable cases, 14, four cured. The rate of cure in all cases treated by radium was 4·5 per cent., and even in operable cases only 28 per cent., and though he was a believer in the value of radium after research had cleared up many points, at present he thought that in malignant cases operation gave the best results, and he foresaw a general resumption of operative treatment.

Prof. W. CHIPMAN (Montreal) agreed with Dr. Forsdike in his plea for more knowledge in the treatment of carcinoma of the cervix by radium. In cases of uterine hæmorrhage radium was most useful where hæmorrhage was intrinsic, especially in fibrosis and chronic subinvolution of the uterus, which were usually the result of mild sepsis. Radium could also be used in some cases of fibroids, and in a few extreme cases of adolescent hæmorrhage which had defied other treatment. Prof. Chipman believed that radium has some effect on the ovary. It should not be used in chronic inflammatory disease of the appendages. He suggested the following dosage: in adolescent hæmorrhage, small doses—e.g., 400 mg. hours; in fibrosis 1200–1600 mg. hours; in fibroids 3000 mg. hours. In Montreal the Stockholm technique was used for the treatment of carcinoma of the cervix, and in the last ten years 289 patients had been treated, of whom about 20 per cent. were alive five years afterwards. He thought that all cases of carcinoma of the cervix were best treated by radium. The primary mortality was only 7 per cent., as against 10 per cent. in operation.

Dr. MALCOLM DONALDSON (London) read a communication on

TREATMENT OF LYMPHATIC GLANDS IN CARCINOMA OF CERVIX

He pointed out that while the original growth responded, as a rule, to radium treatment there had not been the same satisfaction in the treatment of glandular metastases. This might be due to insufficient irradiation, and he had, therefore, devised a method of direct application of radium to the pelvic glands in cases of carcinoma of the cervix. The glands seemed to be more resistant to radium than the original growth, and he suggested that they act not as areas of resistance to generalised metastatic spread but actually as centres in which malignant cells can grow more rapidly. This view, he contended, was supported by the fact that while cancer cells were found in the lymphatics it was not until the glands were reached that any large mass of cancer appeared; moreover, it had been shown that tonsillar extract contained a definite growth-producing substance for tissue culture. It had to be considered whether radium acts by direct effect on the cells, or whether its effect is indirectly due to its action on surrounding cells. If the action was indirect, then it might well mean that the effect on glandular metastasis is far less than on other cells of the body. He described his technique for dealing with glands. He had treated 38 cases on these lines, but was not yet ready to pronounce definitely on the value of the method.

DISCUSSION.

Sir EWEN MACLEAN (Cardiff) laid stress on the perils of indiscriminate use of radium, and urged that it should only be employed by those with special training and experience.

Dr. DONALDSON, in discussing Dr. Forsdike's paper, said that there was urgent necessity for further laboratory work. He did not agree that radium had no effect on the ovaries. The artificial menopause it produced was evidence of ovarian destruction. He thought Dr. Forsdike unduly pessimistic about radium treatment.

Mr. GORDON LUKER (London) held that the Wertheim hysterectomy is the best treatment of carcinoma of the cervix whenever possible. In doubtful cases he employed surgery if the condition was improved by one dose of radium. In frankly ineradicable cases he used radium.

Dame LOUISE MCILROY (London) favoured radium treatment rather than surgery, especially because it conserved the uterus. She agreed that the use of radium should be limited to specialists, and thought it should be followed by X ray treatment. Before treatment every case should be investigated pathologically and biochemically. She found that pyometra might follow treatment. She had tried Dr. Donaldson's method of treating lymphatic glands, but had given it up.

Mr. T. G. STEVENS (London) advised avoidance of radium emanation tubes at all costs, for they rapidly lost their power. He had had no success with radium in the treatment of uterine hæmorrhage in young women. He was sure its action was on the ovaries; destruction of endometrium made no difference. He quoted a case of fibroids in which destruction of the ovaries followed insertion of radium into the rectum for rectal carcinoma.

The PRESIDENT said he had been a pioneer both of Wertheim's methods and of radium. He thought the position of radium was not yet determined, and could only be decided by an analysis of cases after at

least ten years. All reports should be along similar lines, and with corresponding records. The best results had been produced by the Stockholm clinic, but the published results of authorities varied enormously. It was difficult to compare them because the standard of cure has not been determined.

The Placental Hormone Emmenine.

Prof. J. B. COLLIP (Montreal), in opening a discussion on this subject, said that the human placenta contains at least three distinct active principles or hormones. These three substances were alike in that all have been observed to be œstrogenic in the immature female rat. The active principle present in the second fraction (85 per cent. alcohol soluble), called emmenine, was very similar to œstrin in its ultimate physiological effects. It was ineffective, however, in the castrate, and hence it might be concluded that it functions directly or indirectly by stimulating the intact ovary. Also it differed from œstrin in the degree to which it is effective by oral administration. The third fraction, prepared from the alcohol insoluble material of the original extract, was similar to the other two in that it is œstrogenic. It differed from the emmenine fraction on three main points: (1) it is ineffective by the oral route; (2) it produces corpora lutea in the immature rat coincident with induced œstrus; (3) it causes an increase in the rate of growth of the sex glands in the immature male. As yet, Prof. Collip had been unable to obtain with surety from pig and cow placenta any of the above fractions other than œstrin. This observation, which must be studied further, suggested that in the human placenta there are hormones which are absent in lower mammalian forms. This suggestion was supported by the observation that pregnancy urine of certain of the lower forms has failed to give an Aschheim-Zondek pregnancy test when injected into immature mice.

The two œstrogenic placental hormones other than œstrin (theelin) appeared to be the counterparts respectively in placenta of prolan A (œstrogenic) and prolan B (œstrogenic and luteinising) of urine described by Zondek and Aschheim. Prof. Collip was of opinion that these active principles are the specific products of placental tissue function and are actively related to the condition of pregnancy. The functional inter-relationship which must exist between the pituitary sex hormones and those of the placenta could only be conjectured at present. Through the kindness of the Medical Research Council and the National Institute for Medical Research he had recently been given facilities to repeat much of the work outlined in Dr. H. H. Dale's laboratory in Hampstead.

Dr. A. D. CAMPBELL (Montreal) gave the clinical results of the exhibition of emmenine in various gynæcological conditions. He considered that the periodicity of menstruation is due to extract of the anterior pituitary gland. It was believed, he said, that ovulation took place on the fourteenth day after onset of the menstrual cycle. The escaped ovum had no effect on the corpus luteum until it became fertilised. Alterations in menstruation were usually due to ovarian derangements. Dr. Campbell had found that emmenine did not disturb the menstrual cycle in normal people. Treatment of amenorrhœa, either primary or secondary, did not give any appreciable results. Cases of polymenorrhœa—i.e., those in which menstruation occurred too frequently—were improved, in that the intervals were increased. He had achieved the best results in dysmenorrhœa, which was often relieved, though it sometimes tended to recur on cessation of treatment. He had done no good for disturbances of the menopause in cases where amenorrhœa had been present longer than 12 months. Emmenine had never produced abortion in pregnant women.

Prof. CHIPMAN pointed out that this work was in a very early stage, and much remained to be done. He thought that the ovarian hormone was stored in the placenta, and was not produced in situ. Cases of ovarian deficiency were very difficult to treat, because of the mental state associated with the physiological conditions. A good deal of emmenine was available for experiment.

Prof. V. J. HARDING (Toronto) said there was some confusion between the various substances found in the placenta; he thought it was open to doubt that they were produced in situ. Emmenine differed markedly from other organic extracts in that overdoses had no appreciable effect. He found that it had an effect in vomiting of pregnancy which was not entirely mental.

The PRESIDENT spoke of the value of Prof. Collip's work on insulin and parathyroid. Although the present investigations were at a very early stage they were likely to give rapid results under Prof. Collip's guidance.

Prof. COLLIP, in reply, said that a simple explanation of the presence of emmenine in the placenta was that it is produced there. Its presence in other tissues had not been investigated, but it was quite possible that it might be found therein, just as œstrin was. An important fact was that it is active by mouth, and he thought it should be possible to make a preparation for subcutaneous injection. He had found that emmenine has no effect on the male.

Prolapse.

Mr. STEVENS (London) gave a demonstration on the operative treatment of prolapse. He said that in this condition operation had not given the high level of cures achieved in other spheres, and he considered this was because many operators are not fully cognisant of the anatomy of the pelvic floor. After referring to the excellent description given by Hart and Barbour, he said that he based his operation on that described and perfected by Donald and Fothergill of the Manchester school. The foundation was to start repair at the top of the vagina instead of the bottom. He did not amputate the cervix as often as was recommended by the Manchester school, though as a preventive of cancer he regarded this as a very valuable procedure. Abdominal operation was rarely needed to complete the cure. Operative mortality with vaginal operation alone was practically nil. The post-operative treatment was very important, and in his cases he directed the installation of ʒii of flavine solution into the vagina daily.

The PRESIDENT said he had done a similar operation many times, and was convinced of its curative value. In his experience there was often a certain amount of superficial sepsis in the skin of the perineum, but he agreed with Mr. Stevens that serious deep sepsis was rare. He had seen two cases where the ureters were included in the deep sutures at the side of the cervix.

Dr. C. D. LOCHRANE (Derby) said he had done Fothergill's operation many times, and could not understand why it was not more universally performed. Apparently it was not nearly so popular in Canada as operations of the Mayo-Ward or interposition type.

Prof. J. FRASER (Montreal) said that he did a similar operation and did not have much trouble

with sepsis. He did not disturb the bladder at all, and kept a catheter in during the post-operative treatment. In subsequent parturitions he believed in doing a lateral episiotomy.

Mr. STEVENS, in reply, said that there was sometimes slight superficial sepsis of the perineum after operation. He had never seen any trouble with the ureters. He always did a central episiotomy in subsequent parturition, and had never seen any harm result.

Analgesia and Anæsthesia in Childbirth.

Dame LOUISE MCILROY said that in England at present there was much interest in the prevention of pain in childbirth. Funds were being raised for the establishment of special resident anæsthetists in the maternity departments of the large hospitals in London. The medical profession was anxious to relieve suffering, but painless labour could not be achieved artificially without some risk to the mother and more to the child. Anæsthetics were always given in maternity operations and, as a rule, in complicated deliveries, but it was clear that more could be done to relieve pain of normal labour. If every woman was to have an anæsthetic longer attendance by the medical practitioner would be required, and, therefore, more expense. Anæsthetics always tended to prolong labour, and skilled anæsthetists would be required to assist at the confinement. Discussion centred round the question which drugs were suitable as sedatives during the stages of labour and which was the most suitable anæsthetic for delivery. Dame Louise had employed drugs extensively for the relief of pain, and she felt certain that they diminished fear and shock and are, therefore, a factor in reducing mortality. Operative interference was also prevented by analgesics for the patient, and her relatives were not harassed by the sufferings of a prolonged labour.

Morphia in small doses was highly beneficial, but had to be used with caution since it might have a harmful effect upon the child. It was frequently combined with scopolamine, but twilight sleep was seldom fully induced in England, because it required special skill and special surroundings. Chloral hydrate with or without potassium bromide was the favourite sedative in use, because it was safe and easy to give. For the second stage of labour chloroform or ether was given at intervals with deeper anæsthesia during actual delivery. The majority of obstetricians preferred ether, but chloroform had many advocates, especially in Scotland. Chloroform was unsafe in cases of toxæmia, such as eclampsia, or in heart disease; ether was irritant in its effect on the lungs; and the safest and best anæsthetic was nitrous oxide gas and oxygen. This must, however, be given by a trained anæsthetist, and needed cumbersome apparatus. Various local and spinal analgesics were being employed by obstetricians, and opinions differed on their advantages and disadvantages.

Every maternity case, said Dame Louise, must be given individual attention with regard to the sedative and anæsthetic employed. Age, parity, temperament, general health, and complications (if any) must all be carefully considered. Furthermore, the effect of sedatives on the child must be taken into consideration. Light anæsthesia was generally employed in midwifery practice except where operative interference was required. The action of the uterus must be maintained, and hæmorrhage after delivery must be prevented as far as possible. Time and money were a difficulty. It was desirable that private patients should have the continuous attendance of the practitioner during labour if sedatives or anæsthetics were to be given, just as in hospital practice; yet it was impossible to demand this unless adequate financial payment was made.

Dr. HENDERSON (Ignace, Ontario) said that since he began practice he had used chloral throughout labour and had found it very valuable. He did not think that the administration of chloroform was dangerous. He had only had three maternal deaths in over 2000 cases, and none of them was due to chloroform.

Dr. M. MACKELLAR (Gwalior) said she had practised in India for 37 years, and had always used chloral and chloroform without a death in delivery.

Dame LOUISE MCILROY showed two cinematograph films of (1) the classical operation of Cæsarean section performed at the Royal Free Hospital; (2) method of resuscitating the new-born in a case of asphyxia after forceps delivery there.

REVIEWS AND NOTICES OF BOOKS

Rose and Carless' Manual of Surgery.

Thirteenth edition. By CECIL P. G. WAKELEY, F.R.C.S., F.R.S. Edin., Surgeon, King's College Hospital; Lecturer in Surgery, King's College Medical School; and JOHN B. HUNTER, *M.C.*, M.Ch., F.R.C.S., Assistant Surgeon, King's College, Hospital, and Lecturer in Surgery, King's College Medical School. London: Baillière, Tindall and Cox. 1930. Pp. 1592. 30*s*.

To have collaborated in the writing of a text-book on surgery, to have kept it abreast of current surgical thought and progress during no less than 32 years, and to retain its position as a favourite amongst students, is no mean accomplishment. This Albert Carless has achieved. In the thirteenth edition he hands over his position of editor-in-chief to his able collaborator in the preparation of the last two editions, Mr. Cecil Wakeley, who has in turn enlisted the help of Mr. John Hunter. Those who have taken no part in such work can only faintly discern how onerous is the task of editing a text-book of modern surgery; but Mr. Carless will have a reward, for he will take with him in his retirement the well-wishes and gratitude of multitudes of medical men in all parts of the world, whose first introduction to surgery was rendered easier by his labours.

The reputation of "Rose and Carless" will not suffer at the hands of the new editors; in this edition, at least, it is well maintained, for the book is thoroughly up to date, and where innovations have been made the spirit of the conception of the original book seems to have been preserved in the judicious selection of subject matter and depth of detail presented. There are, of course, some omissions; a captious critic might find a number, but he would be bound to admit that any student who reads and knows this book will have a thoroughly good ground-work on which to base that more profound knowledge which will only come with the practice of his art. The illustrations are not as good as the text. Some, such as Fig. 461, are unsatisfactory because of the imperfections of the blocks or paper on which they are printed; others are out of drawing, such as Fig. 1, Plate VII., or

untrue to life as Plate XIV., where the disparity in size and vascularity of the entering and emerging segments of intestine is not sufficiently emphasised. The artist who drew this latter picture can surely never have seen an actual strangulated hernia. These are not serious blemishes upon a notable work wherein the new editors have upheld the traditions of one of the finest single-volume text-books of surgery in the world.

Recent Advances in Chemotherapy.

By G. M. FINDLAY, O.B.E., M.D., D.Sc., Wellcome Bureau of Scientific Research. London: J. and A. Churchill. 1930. Pp. 532. 15*s*.

THE word chemotherapy always arouses pleasant anticipation in the medical man's mind, possibly because the discovery of a specific chemical remedy for each disease is the ideal at which everyone is aiming. It was the discovery of salvarsan which proved what a wonderful advance in treatment chemotherapy could bring, and stimulated an interest in the subject which is not likely to fade.

This newest member of the "Recent Advances" series is much larger than some of its predecessors, containing some 500 pages. It is, indeed, almost too detailed, for it is not easy to read. As a book of reference, however, it forms about the only thorough work of its kind in England, and is almost a counterpart, although not so large, of Fraenkel's "Die Arzneimittel-Synthese." The book is divided into chapters, each of which deals with the chemotherapy of a different disease. There are chapters on malaria, syphilis, leprosy, tuberculosis, cancer, &c., all of them well and clearly written. It is doubtful whether some of the chemical formulæ are altogether necessary, and their omission would have helped to lighten the reader's task. Dispersed throughout the book are pictures of the prominent workers in this field, the opening one being of Ehrlich and his assistant. The references and index are very full and the book forms a valuable work of reference.

Recent Advances in Physiology.

Fourth edition. By C. LOVATT EVANS, D.Sc. Lond., F.R.C.P., F.R.S., Jodrell Professor of Physiology and Fellow of University College. London: J. and A. Churchill. 1930. Pp. 442. 12*s*. 6*d*.

Prof. Lovatt Evans in this fourth edition has chosen wisely what to include and what to omit. The contents embrace the physiology of muscle and nerve, labyrinthine function and conditioned reflexes, together with a study of the blood and the capillary circulation. The most recent information is given in regard to the more important hormones; and two new chapters have been added, dealing with the coronary circulation, and the work of Heymans which throws light on the part played by the carotid sinus in the control of the circulation. The subject matter is well presented, and the author has not hesitated to delete such material as is not of topical interest. Much of the earlier work has been rewritten and brought into line with recent researches. The physiology of muscle and nerve is treated very fully, but this portion of the work might be condensed and so leave room for a chapter on the physiology of mineral metabolism, a subject now recognised as very important. On page 421 it seems that the author has not fully acquainted himself with the most "recent advances" in the ætiology of milk fever in cows.

This edition, like its predecessors, will well serve the purpose of students anxious to obtain information which otherwise could be got only by a laborious search of the literature. It should be studied by all who aim at keeping abreast of modern developments in physiology.

Gonococcal Infection in the Male.

Second edition. By A. L. WOLBARST, M.D., Urologist, Beth Israel Hospital, New York. London: Henry Kimpton. 1930. Pp. 297. 25*s*.

THIS useful manual first appeared in 1927, and in the present edition the author has successfully resisted the temptation to enlarge the subject matter, the increase of 60 pages being mainly due to additional illustrations. The methods of treatment described do not materially differ from those in use in this country. It will be noted, however, that Dr. Wolbarst is one of those urologists, not few in number, opposed to the Janet irrigation treatment, which has, possibly unfortunately, now almost become standardised in this country. Instead he is an eloquent advocate of the old-fashioned urethral syringe, but with the important proviso that this must be handled by the physician, not the patient. For posterior irrigation, similarly, he recommends the use of a large bladder syringe, somewhat similar to the Thomson-Walker type used in this country. In the matter of drugs, the author is an advocate of the chemotherapeutic treatment of McDonagh, and in diathermy he follows closely the teaching of Cumberbatch and Robinson. It is interesting to note that he too has found diathermy, as at present applied, quite useless in the treatment of acute anterior urethritis in the male. The section on sterility in the male has been expanded, and the text generally has been revised, giving a sane, balanced, up-to-date picture of present-day treatment.

Symptoms of Visceral Disease.

Fourth edition. By FRANCIS MARION POTTENGER, A.M., M.D., Medical Director, Pottenger Sanatorium for Diseases of the Lungs and Throat, Monrovia, California. London: Henry Kimpton. 1930. Pp. 426. 31*s*. 6*d*.

IN this edition some additions have been made and a new chapter is included on the pharmacological and clinical tests "for sympathicotonia and parasympathicotonia." This chapter is in fact merely a cursory account of a number of tests with little criticism of their practical value, and insufficient detail to enable the reader to employ them. In other respects the book maintains its former scope, and is a real attempt to interpret symptoms of disease in terms of reflex nervous action. As a study of our recent physiological knowledge applied to clinical medicine it deserves to be read. The conception of sympathetic and parasympathetic reflexes of secretory, motor, sensory, and trophic types and their relation to diseased conditions may not be familiar to all clinicians; Dr. Pottenger gives a full description of this conception with some admirable illustrations and numerous references to larger works in the first part of this book. An appreciation of the importance of the vegetative nervous system and the endocrine glands is even more vital to the study of general medicine. The second part of the book is taken up

with a general review of the relationship between the vegetative nervous system and the symptoms of visceral disease, and the third part with the study of individual organs and their important "viscerogenic" reflexes. Clinical applications of these reflexes are given, and the author shows how disease of one viscus may reflexly lead to marked alteration in function of other and distant viscera. Dr. Pottenger's book will give, perhaps, a new point of view to some, and to others will offer explanation of a diversity of symptoms. For these reasons it may be recommended, though some of the views expressed are open to criticism. The printing and illustrations are excellent.

X Rays.

By B. L. WORSNOP, B.Sc., Ph.D., Lecturer in Physics, King's College, London. London: Methuen and Co., Ltd. 1930. Pp. 101. 2*s*. 6*d*.

THIS book on X rays is by the general editor of Methuen's recent Monographs on Physical Subjects. This series will commend itself to a wide circle of readers, who must, however, be prepared to obtain some knowledge of the subjects before attempting to read the monographs. Mr. Worsnop has tried within the compass of 100 pages to give an account of the developments in the science of X rays since their discovery. The reader is certainly given the essence of the subject, and if he does not find as many details as he would wish, he will remember what the author has clearly stated in his preface, that the book is only an outline. The references throughout the book are to individual pieces of research work which have been real sign-posts on the main road of discovery. Among the few flaws are the diagrams, some of which are so small that a magnifying glass is necessary to decipher them. The author expresses the hope that medical radiologists may find a use for the book. We feel sure that they will, but they must not expect to find it easy reading.

MENTAL HEALTH IN SCOTLAND.

THE sixteenth annual report of the General Board of Control for Scotland [1] opens on the modern and important subject of occupational therapy. Although it has long been the custom to set patients to work, they were often employed in the past more to keep them out of mischief and to reduce their cost of maintenance than for their personal benefit. Treatment by work in the modern sense appeared early in Scotland, for the Brabazon Society's voluntary workers demonstrated the value of handwork long before paid instructors were appointed. There is perhaps a tendency to over-rate the importance of the new "arts and crafts" idea of occupational therapy and to forget the real value of work in farm, garden, and house. This, after all, is the kind of work to which most patients in public hospitals have been born and trained and much of it has the advantage of providing physical exercise in the open air for patients of both sexes. The Board therefore encourages institutions to acquire and work land, and the advantages of this measure—primarily intended as a form of mental treatment—include a more varied and healthier dietary for all the inmates, a financial profit, and a more tranquil life for the restless and energetic patients and all who come into contact with them. The Board suggests further that some small remuneration should be made to recoverable patients, because this provides at the same time the necessary incentive to labour and some hope for the future, since they leave the hospital with a little money in hand.

PATHOLOGICAL WORK.

An interesting innovation is the establishment of a special department for carriers of enteric and similar fevers. Segregation of these people is of the utmost importance to the asylum population, not to mention the peace of mind of the staff. One of the Glasgow asylums, having to investigate an outbreak of contagious abortion in its herds, tested 112 consumers of the infected milk and other persons in contact with the cows. Ten men reacted positively to tests both for *Brucella abortus* and *B. melitensis*; nine of them lived in the farm colony and four worked in the byres. All were in good health, but when their histories were investigated carefully they were found to have had recurrent mild febrile attacks. Undulant fever is, therefore, endemic in this hospital.

The report notes with regret a decrease in research in institutions since withdrawal of the Government grant; small as this grant was, it seemed to provide a stimulus. The Medical Research Council and other trusts have, however, contributed to the work of the Scottish Asylums' Pathological Scheme, and the financial condition of the laboratory at Edinburgh is satisfactory.[2] During the year 192 specimens from nine hospitals were investigated in this laboratory, and the usual undergraduate and post-graduate teaching courses were held. The pathologist has published work on infection of the brain from septic foci in its neighbourhood. Other research has dealt with gliosis, the relationship of the lymphatic system of the peripheral nerves to the central nervous system, and the degeneration and regeneration of peripheral nerves.

THE FIGURES FOR 1929.

On Jan. 1st of this year there were 19,059 insane persons under the cognisance of the Scottish Board, an increase of 28 during the year. The total number of patients admitted during the year was 3173, a decrease of 136 on the previous year, but only one less than the average for the quinquennium 1925–29; of these, 800 were voluntary patients, of whom there were 950 in residence on Jan. 1st, 1930. The death-rate was 9·2 per cent. During the year 158 private and 969 pauper patients were discharged recovered. The Board's report does not reprint the reports of the visiting commissioners on each institution, but provides instead a brief account based on these reports. In Scotland, considerable interest is taken in the boarding-out system, and patients in crofts and small farms are exceptionally well fed and cared for.

There were 3074 mental defectives under care at the end of last year, two-thirds of them in institutions. The inmates are taught handicrafts and kept employed; there are, however, no farm colonies.

The Board has had under consideration the conditions of service of the nursing staff, for there has been some movement towards the establishment of an eight-hour day. The Board does not feel, however, that mental nursing is a profession lending itself to a rigid limitation of working hours and prefers to press for general improvements, such as the provision of nurses' homes and married quarters and an adequate supply of staff to allow for leave and recreation.

[1] Edinburgh, H.M. Stationery Office, 1930, pp. lxv.+44. 2*s*.

[2] Scottish Asylums' Pathological Scheme: Thirty-third Annual Report, 1930.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 27, 1930.

ON KEEPING AN EVEN WARMTH.

THE heat regulation of warm-blooded animals represents a biological mechanism of extraordinary subtlety and efficiency. A physicist would probably be surprised to see a small glass vessel, containing (say) 20 g. of water, exposed to variations of 30° C. or more and yet maintaining its temperature constant within one or two degrees. But this is what a mouse does unfailingly. The small mass of living cells represented by the body of a mouse not only generates enough heat to maintain the temperature if necessary 20 or more degrees above that of the environment, but it also keeps that temperature constant within very narrow variations, although the covering of the body consists of a very thin skin with little adipose tissue. As it is obviously a much easier problem to maintain at a constant temperature a huge tank containing many hundredweights of water, so the maintenance of a constant temperature in large animals, such as the horse, the cow, or the elephant, strikes one less by its efficiency. Even the heat regulation of the human organism, which for this purpose one may regard as a tank containing from 60 to 70 litres of water, seems an easy task compared with that successfully accomplished by a mouse. In his Croonian lectures, the publication of which is completed in our present issue, Sir CHARLES MARTIN has given a brief but masterly survey of the general plan on which this mechanism is built. He ends up by an enthusiastic declaration in favour of dress reform, the application of which, however, he wisely restricts to tropical climates. If we could imagine a man and a mouse crossing London Bridge on a gusty March day, both dependent entirely on the resources for keeping an even warmth with which Nature has endowed them, man would cut but a poor figure. It may indeed be doubted whether the human organism in its present state can accomplish the task of heat regulation without the aid of clothing and fire. At any rate we know that clothing and fire are among the earliest inventions of man, and were used by man even in palæolithic times. Most of us are familiar with the depressing effect of exposure to cold, when inadequately clad. The whole organism then concentrates its efforts on the task of "keeping an even warmth," and if this continues for any length of time a mental degradation sets in which goes even deeper than that produced by hunger. It is perhaps not too fanciful to associate the mental development of man with his invention of fire and of clothes, which freed him from the necessity of struggling against his thermal environment. It might even now be an interesting task for psychologists to see whether any relationship exists between mental activity and the thermal environment, both internal and external.

Enough has been said to show that the mechanism of heat regulation is one of very great complexity. Sir CHARLES MARTIN in his lecture has naturally laid most stress on the nervous mechanism, since that is the one which is most susceptible to experimental investigation and which has been very fully worked out. It is significant that Sir CHARLES finds it necessary to split the heat-regulating "centre" into three "centres." A logical purist might perhaps boggle at the notion and ask at what stage of this process of decentralisation a "centre" ceases to be a "centre," especially when in each case the centre is postulated to preside over a great many different functional systems: skin, circulation, respiration, metabolism. The conception becomes clearer if it is realised that, as Dr. W. CRAMER has pointed out, heat regulation is essentially the function of the sympathetic system including the thyroid and adrenal glands—a conception which has been confirmed recently by the work of CANNON, HASAMA, and others.

The mechanism of heat regulation is not the same in all mammals. In some species the activity of the sweat glands plays an important part, in others sweat glands are practically absent. Animals which regulate with the help of sweat glands are better able to withstand high temperatures, and this raises the interesting question whether the difference represents an adaptation to changes in climatic condition or whether it can be taken as indicating that these two different groups of species had their origin under different climatic conditions. To the clinician the pathology of the mechanism of heat regulation is of special interest. It is curious to reflect that, although fever is perhaps the commonest pathological phenomenon, it is still largely an unknown territory. Fever is the Cinderella of physiology and pathology—and also of pharmacology. For while antipyretics are among the drugs most commonly prescribed, our knowledge of their mode of action is even more defective than that of the condition which they are intended to relieve. Sir CHARLES MARTIN in his lectures quotes a statement by ISENSCHMID that the organism for the purpose of heat regulation has a whole orchestra to play upon, and he refers to the comparatively recent discovery that even the endocrine organs represent a hitherto unrecognised group of instruments. If this is true it also follows that these instruments can be called into action by changes in the external thermal environment, and by those conditions which manifest themselves by changes in the internal thermal environment—i.e., fever. Such a conclusion has extensive clinical implications. But clinicians and pathologists have been slow to take advantage of this new conception. In his recent Lettsomian lectures on the relationship of dermatology to other branches of medicine,[1] Dr. H. W. BARBER has shown how it can be used to correlate certain clinical manifestations, and there can be little doubt that similar progress will follow its application to other problems of clinical medicine.

[1] THE LANCET, 1929, ii., 363.

MEDICAL TREATMENT OF CONGENITAL PYLORIC STENOSIS.

IT has come to be the accepted practice in this country, at any rate in hospitals, for nearly all cases of congenital pyloric stenosis to be operated upon. As a result of good team-work the mortality-rate has been slowly reduced so that Dr. F. J. POYNTON, for example, in a recent report [1] was able to describe an 80 per cent. recovery in a series of cases. Despite this success most physicians dealing with these infants have not felt convinced of the absolute necessity for surgical intervention, and recent continental work with thickened feeds has been watched with interest. One difficulty about accepting the conclusions of the German school has been that under the title of "pylorospasmus" have been included cases in which the certain diagnosis of pyloric stenosis (by palpation of a pyloric tumour) has not been made and in general too little information about the clinical condition of the infants has been supplied. A recent paper by Dr. S. WOLFF, of Eisenach,[2] however, meets these objections and his spectacular results with medical treatment deserve close study. He is a sturdy opponent of the surgeons in this matter and his experience is a wide one. From 1912 to 1930 some 98 cases of congenital pyloric stenosis were under his care, and he lays down the cardinal points in diagnosis as vomiting, constipation, visible gastric peristalsis, and the presence of a pyloric tumour. All these cases were treated by him personally, the necessary procedures being carried out either by himself or under his direct supervision. The diet he now gives to these infants consists of frequent small feeds of thickened protein milk with added sugar, although formerly he used to prefer breast milk. Subcutaneous salines are injected at the onset in severe cases and stomach wash-outs begin the treatment in all cases. Atropine in the form of the valerianate is given by the mouth in drop doses with each feed; Dr. WOLFF believes that this preparation is the most useful because the sedative effect of the valerian counteracts any tendency of the atropine to excite the central nervous system.

The 98 cases treated during the 18-year period comprise 58 boys and 40 girls; it is an interesting fact, commented upon by other observers, that the majority of cases occurred in the first half of any year. Six only of the patients were operated upon and of the 92 cases medically treated only two died, giving a recovery-rate far superior to anything yet produced by surgical methods. An interesting feature of Dr. WOLFF'S series is the large number—80 out of the total 98—treated as out-patients. He classifies his cases under the four headings of mild, moderately severe, severe, and very severe, and in a comprehensive table sets out full details about the weight and progress of each child, including a note whether in his view the infants would have stood an operation. Many of the cases described suffered from complications which would have added greatly to the risk of any surgical procedure. Dr. WOLFF points out that while plastic operations on the pylorus do certainly relieve spasm at that site, spasms at other situations in the alimentary canal, which are not uncommon in these cases, are not benefited by such operations. This view will be new to most observers in this country, but it may explain some of those cases where vomiting continues after Rammstedt's operation in an unexplained manner. Dr. WOLFF quotes, with disapproval, a dictum from a surgical publication that "better one child too many operated upon than one child too few." While this may hold, he says, for acute appendicitis, the position is quite different when the physician is dealing with an infant only a few weeks old. He hints, also, that the widespread increase in the number of cases of pyloric stenosis occurring in hospital records during the last few years is directly due to too much surgical interest in the condition. While this may be dismissed as a provocative statement when it is included in a paper with a frankly anti-surgical bias, it should nevertheless stimulate physicians to consider whether the present line of treatment by Rammstedt's operation is the best which medicine has to offer for a malady where spontaneous cure is known to occur after the third month of life.

[1] Practitioner, 1930, cxxv., 24.
[2] Jahrb. f. Kinderh., 1930, cxxviii., 287.

TREATMENT OF TRAUMATIC EPILEPSY.

NEUROLOGISTS have been aware for some time of the important investigations into traumatic epilepsy which have been conducted by Prof. OTFRIED FOERSTER of Breslau, and which have led him to develop a surgical technique for the treatment of selected cases. The physiological basis of this method of treatment is set out in two recent papers [1] [2] by Prof. FOERSTER and Prof. WILDER PENFIELD, of Montreal, which will repay study by all who are interested either in epilepsy or in the surgery of the nervous system. A happy union of FOERSTER'S study of excitable cortical areas and PENFIELD'S investigations of the behaviour of scar tissue in the nervous system has produced fruitful results. Not only has their collaboration suggested a plausible explanation for at least some forms of traumatic epilepsy, but it has also, if we accept the explanation, provided a rational basis for surgical treatment. FOERSTER, by electrical stimulation of the cerebral cortex in over one hundred patients under local anæsthesia, has outlined certain definite epileptogenic cortical areas which extend considerably beyond the "motor cortex" so called. In fact, such excitable areas are to be found in front of, and also behind, the precentral convolution as well as in the temporal and occipital lobes. The movement patterns which follow the stimulation of such areas provide a local sign which often makes it possible to localise the cortical focus of an epileptic discharge. These patterns are described in detail by FOERSTER and PENFIELD. The latter's

[1] Foerster, O., and Penfield, W. G.: Brain, 1930, liii., 99.
[2] Penfield, W. G.: Canad. Med. Assoc. Jour., August, 1930, p. 189.

researches into the process of scarring which follows experimental injury of the brain have shown that widely different reactions occur according to whether or not the damaged cerebral tissue is removed. If it remains, a scar containing connective tissue and fibrous astrocytes is rapidly formed and becomes densely attached to the overlying meninges and invaded by a rich plexus of newly formed blood-vessels. The scar contracts steadily for a period of years, and this contraction is responsible for the displacement of the cerebral ventricles towards the lesion which FOERSTER has demonstrated by encephalography. It is suggested by FOERSTER and PENFIELD that such scars are responsible for the occurrence of traumatic epilepsy, possibly by means of vasomotor changes reflexly induced by changes of tension. Surgical excision of such scars, if the bone-flap is not replaced, is followed by a more favourable type of gliosis which does not exert a similar traction upon the cerebral tissues. This is held to be the explanation of the beneficial results of such operations following which patients, formerly epileptic, have been free from fits for a number of years.

FOERSTER and PENFIELD'S work suggests reflections of both theoretical and practical interest. SARGENT reported that among 18,000 cases of gunshot wounds of the head, 800, or 4½ per cent., developed secondary epilepsy. This incidence has been interpreted as evidence in favour of some underlying predisposition to convulsions which is present in only a small proportion of individuals, and which is assumed to be necessary if cerebral trauma is to give rise to epilepsy. PENFIELD, however, suggests on the basis of W. W. WAGSTAFFE'S work that variations in the severity of the injury, especially whether or not the dura is penetrated, are an important factor in the production of this sequel. Nevertheless, even in traumatic epilepsy there is sometimes clear evidence of predisposition in the family history. It would be interesting also to know whether FOERSTER and PENFIELD'S observations throw any light upon the difference between the various clinical forms of focal epilepsy. At one extreme is the slow march of the Jacksonian attack; at the other the brief focal onset of a generalised fit, while epilepsia partialis continua remains a localised convulsion. Further, traumatic epilepsy which first manifests itself in the Jacksonian form may in course of time develop into fits which are generalised from the onset of the attack.

This work puts traumatic epilepsy in a new light and it is reasonable that operative treatment should be considered in such cases. Whether it should be carried out in a given case will depend upon several factors, especially whether the pattern of the fit or the presence of physical signs indicates the epileptogenic focus, whether encephalography provides evidence of a scar, and, perhaps most important, whether a surgeon with experience of the technique is available. Physiologically it is doubtful whether there is any reason for separating traumatic from other forms of epilepsy, for in many so-called "idiopathic" cases there is as good evidence for the focal origin of the fit. A better understanding of traumatic epilepsy, therefore, cannot fail to enlighten us upon the pathogenesis of convulsions in general.

ANNOTATIONS

THE PATIENT AS A WHOLE.

NOWADAYS it is widely taught that the patient must be regarded as a whole and not as an example in nosology. But there is still occasion for Dr. F. G. Crookshank's trenchant attack on what he calls "the organic school," or "school of mortuary medicine," and the "neuro-humoral school, who detest taking cognisance of what they call the subjective no less heartily than do the mortuary doctors refuse to admit the importance of the merely functional." [1] He urges the need for a comprehensive view of the individual, who is ill because he has "lost whole-th." It is, he thinks, a relic of mediæval demonology to say that we are "attacked" by disease, and the apparent support given to this attitude by bacteriology has been weakened by increasing recognition of the importance of the factor of resistance. Dr. Crookshank would no more allow us to suffer from "an attack of neurasthenia" —or presumably typhoid or influenza—than "an attack of adultery." He is an ardent apostle of the truth that, to study and diagnose any case completely, the doctor must consider the patient physically as carefully as any member of the organic school could wish; physiologically, in the spirit of the neuro-humoral school; and—neither more nor less important —psychologically. It is not necessary to say that he has a soul, but he has consciousness and memories—conscious, subconscious, and unconscious. Unless the physician takes stock of these, he is not taking stock of the individual. Every illness has its psychological aspect, and the good clinician faced with a patient who complains of vomiting ought not, in his absorption either in the digestive prescription, the test-meal or the areas of hyperalgesia, to forget also to ask—in an appropriate manner—"What are you sick of?" Dr. Crookshank takes his stand on the work of Alfred Adler and his followers, and finds in this school the most satisfactory marriage between psychology and clinical medicine. Adler's principles, put briefly, are that some inferiority or inadequacy in a bodily organ will account for disease, especially functional disease, without the intervention of any extrinsic factor, and that neuroses and psychoses commonly develop in association with organ-inferiorities. An organ which, because of some morphological or functional inferiority, is the weakest link in the chain, is more likely than others to break down under stress, but this congenital or acquired inferiority may be expressed in successful compensation, or in over-compensation, which itself causes distress. Or the purely psychological sense of inferiority, which is the heritage of everyone, may attach itself, if not overcome by suitable training and by personal courage, to the organ which suffers from some defect, and so establish a "functional" disorder. "Every neurosis," Dr. Crookshank says,

[1] Individual Psychology and General Medicine. F. G. Crookshank, F.R.C.P. Psyche, Cambridge, 1930, pp. 27, 1s.

" can be understood as an attempt to free oneself from a feeling of inferiority in order to gain a feeling of superiority."

CANCER RESEARCH IN AUSTRALIA.

THE difficulties of obtaining accurate and uniform records of treatment and results in cases of cancer are particularly great in Australia, where a relatively small population is scattered over a continent; but the establishment of consultative groups, consisting of physicians, surgeons, radiologists, and pathologists, has been adopted at the centres where radium is in use, and returns of cases have been analysed by Dr. Arthur Burrows, who has been acting as radium and cancer adviser to the Commonwealth Government. To what extent it is permissible to draw deductions from these returns has been recently discussed by Dr. Burrows in our own columns [1] when he announced the imminent appearance of an official report of the conference of Australian Cancer Organisations, held at Canberra, in April last. This report, a copy [2] of which has now reached us, while it does not add materially to our knowledge of cancer, contains observations of more than passing interest. In Queensland, we learn, lead therapy has been discontinued as the result of an unfavourable report by Dr. L. M. McKillop, of Brisbane, after investigation which included visits to Liverpool, London, and certain American cancer clinics. Dr. W. J. Penfold, of Melbourne, discussing some of the possible avenues of research, suggested that it would be valuable to discover whether there were any individuals in whom the general resistance of the tissues to lead was greater than that of the local growth; it would also be of service to be able to detect those who were supersensitive to the action of lead. Radium and X ray therapy have received careful study. Dr. E. H. Molesworth, of Sydney, advocated a close watch on the pathological characteristics of every tumour in order to choose for each patient the treatment offering the best chance of life. He is opposed to the belief that a shorter wave-length has a selective action on malignant cells; owing to the localised character of the intense effect of embedded radium it is, he believes, possible to deliver to the growth, without danger, a dose double the size of the X ray erythema dose. Although it would be possible to achieve the same dose, say in the uterus, by means of the deep X rays, the effect would be much more widely distributed and would involve bowels and bladder; the advantage of radium, he considers, lies not in the penetrating properties of its rays, but, on the contrary, in the rapidity with which the intensity of its radiation fades as it leaves the source of origin. He offers this as an argument against the use of the radium bomb where deep X rays can produce the same effect; not only is it less expensive to use X rays than a radium bomb at a distance of 20 or even 10 c.cm. from the skin, but the danger to attendants and operators is eliminated almost entirely. Both methods have the same limitations of dose as registered by the skin reaction, and the only advantage he finds in the radium bomb is that the dose may be delivered continuously over a period of days, instead of intermittently as with deep X rays. X rays can do as much as radium at a distance in supplementing implantation, and the measurements of dosage are more accurate and better expressed.

An observation deserving remark has been made by Dr. McKillop, who finds that precancerous conditions of the skin appear to be very common in Queensland, and an investigation has been undertaken by Dr. J. V. Duhig, to decide the importance of sunlight as a factor in the genesis of cancer of the skin.[3] Apparently, hyperplasia with a malignant tendency is so common in Australia that clinical diagnosis is quite unreliable. In hyperkeratosis the best results have been obtained with carbon dioxide snow, and with definitely malignant lesions radium in the form of a plate has been employed with some success. The use of other methods has not meant the neglect of surgery, and the value of the endotherm knife of Wyeth—the electric scalpel—is strongly advocated by Dr. A. J. Cahill, of Canberra. The absence of much tissue manipulation, the sterilisation of the field by the knife, and the rapidity of healing are among the advantages his experience has led him to expect; in addition, hæmorrhage is lessened, and owing to the destruction of sensory nerves, pain is much reduced. He observes, however, that the use of this instrument cannot be learned completely during a short experience; it calls for judgment and discrimination in its application, and for increasing boldness with a growing technique.

TREATMENT OF SECONDARY ANÆMIA.

STIMULATED by the success of liver feeding in pernicious anæmia, many workers have tried this form of therapy in cases of secondary anæmia; but, although reports are conflicting the main consensus of opinion seems to be that it is of little value. Giffin and Watkins [4] have lately studied the effect of desiccated fœtal liver in obscure secondary anæmia. The liver was obtained from fœtal calves at the age when the blood-forming islands of the liver parenchyma show their greatest activity. The investigators find that about 80 per cent. of 102 cases which received adequate doses showed well-marked improvement. Thirty-five cases in which both iron and adult liver had previously been administered with no effect responded to treatment with desiccated fœtal liver. Although it may be necessary to persevere with the treatment for as long as two months before there is any improvement, once this improvement has begun it seems to persist, even if treatment is discontinued. One reason for inconsistency of results in the treatment of secondary anæmia is probably the number of different conditions which receive this diagnosis. On careful examination many patients with chronic secondary anæmia are found to harbour some chronic focus of infection, or to have small chronic hæmorrhages from a lesion of the alimentary tract. In cases of post-hæmorrhagic anæmias which exhibit delayed blood regeneration, Dyke [5] has found that liver therapy is attended with marked improvement. Recently, Witts [6] has called attention to a group of cases which he calls "simple achlorhydric anæmia." Although the condition has been described before, it does not seem to be generally recognised in this country, and is mentioned in none of the standard text-books on diseases of the blood. The syndrome, he says, appears to be closely related to pernicious anæmia, but the blood picture never shows any megalocytosis. It is far more common in women than in men, and achlorhydria is the rule. The spleen may be palpable, there is frequently

[1] THE LANCET, August 9th, p. 330, and August 16th, p. 380.
[2] Commonwealth of Australia, 1930. Canberra: H. J. Green.
[3] On this subject see Findlay, G. M.: THE LANCET, 1928, ii., 1071, and 1930, i., 1229; also annotation, 1928, ii., 1087.
[4] Giffin, H. Z., and Watkins, C. H.: Jour. Amer. Med. Assoc., August 23rd, p. 587.
[5] Dyke, S. C.: THE LANCET, 1929, i., 1192.
[6] Witts, L. J.: Guy's Hosp. Rep., July, 1930, p. 253.

glossitis, and nervous symptoms, such as acro-paræsthesiæ, may occur, but it is doubtful if there is ever true subacute combined degeneration of the cord. No evidence of blood destruction is observed, the van den Bergh reaction being negative. Another curious sign sometimes seen is that the finger-nails, instead of being convex, as normally, may be concave or spoon-shaped. Although achlorhydria is apparently the main ætiological factor, since it is present before the anæmia develops and persists after its cure, administration of hydrochloric acid is entirely valueless, as also is liver feeding. However, marked improvement of the anæmia and general health, including the finger-nails, follows the exhibition of iron in large doses (two or three times the pharmacopœial dose). Witts thinks the condition is closely allied to the Plummer Vinson syndrome of dysphagia with anæmia. These observations are useful as indicating the lines along which clinical research must progress before "secondary anæmia" ceases to be considered a diagnosis, and takes its proper place as a symptom.

MYOPIA IN SCHOOLS

A REPORT by Mr. C. L. Gimblett[1] deals with refractive changes in the eyes of 170 children from the East Ham Council Schools, observed by him for varying periods during the six years from 1923 to 1929. All these children showed either some degree of myopia in one or both eyes, or an astigmatism in which either one or both meridia were myopic, this being found at the latest—not necessarily at the first—examination. The conclusion of the author is that in the East Ham schools the average rate of progression of myopia during school life is 0·4 dioptre per eye per year—that is to say, a child entering school at the age of 5, with normal sight but with a tendency to myopia, progressing at this rate for ten years, would leave school at 15 with a myopia of 4·0 D. Comparing the different schools it is found that in certain schools the incidence of myopia is far higher than in others, so that the schools can be arranged in order according to their "myopic index"—i.e., the figure representing the relative number of myopic pupils. Correlating this with the different factors likely to affect myopia, it is found that where competition for scholarships is keenest, as in the secondary school, there myopia is most frequent. On the other hand, the rate of growth of myopia is not so high in these schools as in some of the smaller ones where competition is not so keen. No explanation of this is suggested. No evidence was found that bad lighting had any unfavourable effect on either the incidence or the progress of myopia. The influence of heredity was shown in a large proportion of myopes, and in families free from myopia there was evidence that the onset of myopia was often preceded by one of the common infectious diseases. Of the children examined, 101 were girls and 69 boys. The greater number of them —78 per cent.—were first found to be defective during the middle period of school life, between 8 and 12, and the periodic examinations revealed that the myopia progressed most rapidly during this period.

The great majority of the cases with which this report is concerned are those of ordinary school myopia, with no fundus change beyond the ordinary "myopic crescent." A few high myopes are included in the list, and it is an unsolved problem in the case of highly myopic children how far the condition is due to a congenital malformation and how far to a stretching of the sclerotic coat after birth. According to Mr. Gimblett, congenital myopia is a distinct entity, and does not tend to become worse as the result of the stresses and strains of childhood and adolescence, but beyond citing a few cases in which myopia of moderate degree remained stationary during school life, he gives no sufficient evidence to support his view. In any case there will be general assent to his recommendation for the treatment of the East Ham myopic children, which are on lines generally adopted by progressive education authorities elsewhere. Three types of modified education are available. (1) *Easy treatment.* At school the pupil is allowed to sit in front and to read large print for not more than a quarter or half an hour at a time. Homework is curtailed, and girls are not allowed to sew, but may knit. Special attention is to be paid to the "stance" (sitting up). This treatment was prescribed for any myopic pupil if, after a few months, the myopia was progressive. (2) *Oral teaching only* is prescribed when "easy treatment" fails to arrest the progress of myopia, or when it is not practicable for the pupil to be taught in a special myope class. Books and writing materials are prohibited both at home and at school, and unless the procedure is to be a farce, the coöperation of parents at home is essential. Writing in the free-arm manner on blackboard or paper in characters not less than two inches high is allowed. Oral lessons are attended. No gymnasium or dumb-bell exercises are permitted; exercises with bending and stretching are supposed to be bad for myopia, on the theory that any congestion of the head and eyes favours its increase. (3) Lastly, there is the myopes' *sight-saving school*, reserved for specially bad cases and organised on the lines laid down by Mr. Bishop Harman, in which "oral teaching only" is more systematically carried out than is generally practicable in the ordinary school,.

A certain number of these children—8 out of 170—were found to have a divergent squint before the age of 15, due to fatigue of the converging muscles and of the coördinating mechanism by which they are governed, and this constitutes a further argument in favour of the precautions recommended.

[1] Published by the East Ham Education Committee.

EUGENIC REFORM.

ADDRESSING the International Federation of Eugenic Organisations on Sept. 12th, Mr. C. J. Bond said that medical inspection of 6,000,000 children in 1928 showed that 1,000,000 were so defective, physically or mentally, as to be unable to derive reasonable benefit from the education provided by the State. He added that in the opinion of experts a considerable proportion of this unfitness is the outcome of inherited tendency. At the same meeting Sir Arthur Keith discussed the changes produced by civilisation which have made natural evolution unsatisfactory as the controller of our destinies. At present, humanity is a mere pawn in the game, but it is high time for it to take a hand. The possibility of eugenic reform depends, in Sir Arthur's opinion, on the extent to which human nature can be rationalised and the times are now more favourable than ever before; for increase of population is forcing public attention to the subject. All human communities being unstable, the aim of eugenists is to control the direction of their changes to the advantage of the race. They will find allies in the many men and women nowadays interested in the laws of human heredity, but eugenics has a

formidable antagonist in the instinctive obedience of mankind to the demands of Nature for reproduction—of whatever quality. Unfortunately or fortunately, human beings are ruled less by reason than by passion, emotion, prejudice, and instinct, and Sir Arthur gives no indication of the time which will be necessary to breed out these characteristics.

COLONIES FOR MENTAL DEFECTIVES.

AT the opening of the new Coleshill Colony near Birmingham last week, Mr. L. G. Brock, chairman of the Board of Control, made some remarks on the care of mental defectives in this country. A third of the defective population, or something like 100,000 individuals, were, he said, unfit to be left at large in the community and required institutional treatment. Most poor-law buildings could hardly be regarded as suitable for housing any except the lower grades of defect. A well-organised colony provided opportunities for the higher-grade mental cripples to live a useful life. The Birmingham scheme includes the erection in the 180-acre park of a number of villa annexes, a workshop, and a recreation room, at a total cost of about £89,000. Mrs. E. F. Pinsent, a commissioner of the Board, who was also present at the opening ceremony, thought it might be possible to reduce, to some extent, the numbers needing colony care by the establishment of day occupation and industrial centres, as had been done in Leeds and Bristol, and by setting up hostels where a small proportion of feeble-minded girls and boys could be trained under conditions freer than in the main colony, going out on licence to suitable and carefully chosen situations.

It is an ironical commentary on our statesmanship that 16 years after the Mental Deficiency Act was passed to make proper provision for defectives the great majority are still being cared for, not by the mental deficiency committees of local authorities, but by bodies set up for an entirely different purpose. When, therefore, the county councils took over their new duties in April last, they must have found a large number of mental defectives over and above those ascertained by their own committees. Even under the new Act, defectives under the poor-law will still receive help for some years through the public assistance committee. That all of them may soon be brought under one governing committee is the earnest hope of Dr. F. D. Turner, expressed in the seventy-first annual report of the Royal Eastern Counties' Institution for the Mentally Defective. In a valuable summary of the history of this institution, which was founded in 1848 and first known as "The Asylum for Idiots," Dr. Turner discusses the new duties of the county councils, and points out the unsuitability of the ordinary type of workhouse for defectives, urging the colony as the essential solution. There are now 1300 inmates on the books of the Eastern Counties' Institution, grouped in nine houses; plans for a big extension have been passed and work is now proceeding. The most important event in 1929 was the taking over of Littleton House School, Cambridge, as a part of the institution; another new branch has been opened at the Retreat, Witham, while another farm has also been added, bringing the total acreage to 380. Improvements have been made in the various buildings, much of the work being done by the men and boys themselves. Unless consent is refused, all new admissions to the institution are Schick-tested, and the 61 who gave positive reactions received three doses of toxoid-antitoxin. Except for one boy who caught diphtheria before he was tested, there has been no case since the test was introduced in 1925; before that time small outbreaks occurred repeatedly. There has been a certain amount of mild sporadic dysentery and diarrhœa among the low-grade defective boys at East Hill. All the boys were given a course of antidysentery vaccine by mouth; there were no reactions, and no case has occurred since. The workshops have continued to turn out good work for which there is a satisfactory sale. The death-rate for the year was 1·85 per cent. The average death-rate from tuberculosis during the last three years has been only 0·6 per cent.; 15 cases were under treatment at the end of the year.

ENURESIS.

IN the report of the Kent school medical officer, summarised last week (p. 665), Dr. S. A. Tucker dealt with a matter that deserves more attention than it usually receives. He finds that more than 1 per cent. of school-children wet their beds at night, boys more than girls in the proportion of 7 to 5, that the habit tends to disappear with age, but that when it persists it gives rise to much distress and is a serious hindrance to education and employment. The causative factors of enuresis he groups under the five headings: (1) bad training; (2) physical defects, especially adenoids; (3) nervous causes; (4) nutritional (? absence of vitamin D); (5) thyroid deficiency. Treatment is directed to the removal of these causes, and may be hygienic, medicinal, or psychological. Hygienic measures include the restriction of stimulating diuretics such as tea, coffee, and spices, and of all fluids after 6 P.M., with the inculcation of the habit of micturition (and defæcation) just before going to bed. Removal of adenoids has effected a cure in several cases, and conditions like phimosis or hernia should be dealt with, although they have no direct relation to bed-wetting. Presumably adenoids are of importance in so far as they disturb sleep, while their removal is a starting-point for suggestive treatment. Highly acid or alkaline urine is probably so rarely an essential factor as scarcely to need mention. Belladonna, hyoscyamus, and bromide may help for a time, or may even sometimes effect a cure. Thyroid extract has had its successes, but also its drawbacks. Dr. Tucker does not specify the type of case for which thyroid treatment is appropriate, but here we may get some help from Dr. H. W. Barber's parallel observations on chilblains which are only benefited if hypothyroidism is present,[1] otherwise it is useless or worse. Iodine is regarded with approval by some; it may benefit a few special cases, but the evidence is not complete. As to psychological treatment, Dr. Tucker tells us that the one case treated by psycho-analysis failed completely, while a cure was effected in another child by suggestion of improvement with the prospect of a reward. He is against rebukes or methods liable to cause fear, for there is risk in allowing these nervous and sensitive children to get into a state of despondency; and he does not place the same value on positive suggestion as do others in this country, and especially in America where enuresis has been treated largely on the lines of any other disorder of conduct.[2] In the most recent American study,[3] however, it is admitted that "the data at our command

[1] THE LANCET, 1926, ii., 1180.
[2] THE LANCET, 1929, ii., 396.
[3] Diseases of the Genito-Urinary System in Infancy and Childhood. H. F. Helmholz and S. Amberg, Clinical Pediatrics, vol. xix., pp. 47–59.

seem to indicate that a psychic origin alone cannot be regarded as the only ætiologic factor." Dr. Tucker notes that several of his bed-wetters were of poor mental or social grade; the psychopathology of these cases differs from that of the majority, who tend to be intelligent, highly-strung children. Enuresis is not so common among the mentally defective—apart from the very low grades—as is generally supposed; those who have to deal with delinquents too, have found, somewhat to their surprise, that it is not specially frequent in this group. When the trouble occurs in high-grade defectives or subnormal children it often seems due to laziness and lack of sense of shame, a sharp contrast to the excessive shame and fear which occur in the neurotic. In the subnormal children there is likely, also, to have been a lack of training, and the line of treatment is persistent discipline in the sense of stimulus and training, not of punishment. The rationale is to anticipate the event by adopting, in addition to the usual régime, the following procedure. By inspecting the child's bed at intervals during the night, it is ascertained at what hour it is wetted—usually the time varies but little; the child is then wakened every night about half an hour before this time. The method, which calls for some self-sacrifice on the part of the attendant, has been highly successful, for instance at Besford Court Training School. It takes the place of the American method of an electric bell set in motion by the wetting, which has a less comic but more drastic development in a specialised apparatus which, in addition to ringing a bell, establishes contact with a faradic current sufficiently strong to wake the child. For other types of case methods such as these may do more harm than good; the vital point is to make sure to which type the case belongs and then to persist patiently with the appropriate treatment. This commonly means the elimination of local and physical causes and the faithful carrying out of domestic measures with the help of some simple form of psychotherapy.

TUBERCLE-FREE HERDS.

It is no good pretending that the maintenance of tubercle-free herds is easy. The Birmingham health report for 1929 shows that there are now 19 herds, comprising 663 animals, in the special scheme instituted in 1907 for eradicating tuberculosis from the city's milk-supply. Twelve of these are kept up by breeding and seven by both breeding and purchase. In the 12 breeding herds, comprising about 385 cows, 993 tests during the year resulted in 96 failures and four doubtful reactions. In the seven mixed herds, comprising about 278 cows, there were 34 failures and two doubtful reactions among 757 tests. Nine of the 19 herds are used for supplying Certified or Grade A (tuberculin-tested) milk to the city. Only three herds out of the 19, comprising 120, 49, and 7 cows respectively, had no reactors at the half-yearly testings of 1929. It was as long ago as 1894 that Bang described his scheme, subsequently adopted by the Danish Government, for the gradual eradication of bovine tuberculosis. His large experience had already proved that the calves even of tuberculous mothers were born healthy, and that tuberculin was almost infallible in diagnosis. The precautions proposed for reliable tests were then much as they are now, although the technique has been somewhat improved. In the progress of the Danish scheme unexpected difficulty was found in avoiding reinfection. Obviously this should be easier where a herd is maintained solely by breeding. Recently the tubercle-free herd kept by the Victoria Hospital Trust, Edinburgh, was infected by contact for a short period with a stray cow. Again, is the danger from porcine or other animal tuberculosis always guarded against adequately? The Dumfries county veterinary inspectors recommend double fencing, and also point out that a purchased cow may pass the test but be in the incubation stage, as the result of recent exposure to infection. In Scotland it is held that the use of pastures which have been grazed by infected stock has been a source of trouble. It might, perhaps, be well to have a pooling of experience or round-table conference of veterinary surgeons who have actually had experience of trying to keep herds free from tubercle—to be followed by an investigation of how other countries (such as the United States, Canada, and Denmark) are faring in this campaign. The island of Guernsey has tubercle-free cattle and a more or less normal death-rate from human tuberculosis. It would be interesting to know if the cows in Guernsey are ever accidentally infected from a human source. Such an investigation would be of world-wide interest, and might secure support from a body like the Rockefeller Foundation.

THE ORAL ADMINISTRATION OF A PRECIPITATE FROM CRUDE INSULIN.

From the biochemical department of the Carmichael Medical College, Calcutta, comes the latest attempt to find a preparation with the properties of insulin which can be administered by the mouth.[1] H. N. Mukhirjee, who had previously shown that the blood-sugar level is definitely depressed in rabbits (and also in diabetic patients) after oral administration of the precipitate obtained by treating commercial insulin with phosphotungstic acid, now claims to have produced typical hypoglycæmia with paralysis of limbs and convulsions by using the bulky precipitate obtained from crude insulin prepared in the laboratory, the insulin having been extracted from fresh beef pancreas according to the method described by Somogyi, Doisy, and Shaffer (1924). The precipitate of active substance is taken up in about 50 c.cm. water per kg. of pancreas, and an equal volume of 10 per cent. H_2SO_4 is added to it. After mixing by stirring, 30 per cent. solution of phosphotungstic acid in water is added in slight excess till no more precipitate forms. The precipitate is thoroughly stirred and is allowed to sediment in measuring cylinders. At the end of three or four days the precipitate per kg. pancreas is about 70 to 80 c.cm. in volume. On centrifugalising the volume is further reduced by about half, the clear supernatant fluid is discarded, and the precipitate is ready for oral administration. The substance is said to retain its potency well even after it has been kept at room temperature for several months. The material is treated with an equal volume of distilled water and is thoroughly mixed, 4 to 6 c.cm. of the mixture being given by mouth to rabbits fasting for 20 to 24 hours To diabetic patients fasting for 16 hours 10 c.cm. of the precipitate in 20 c.cm. of water have been given. The substance does not appear to have toxic effect when thus administered, and in many cases the effect on the blood-sugar level is said to be as marked as that of subcutaneous administration of insulin. Doubtless this preparation will be speedily tried out in laboratories. Previous attempts to supply a preparation of insulin or a substitute by the oral

[1] Journal of Physiology, 1930, lxx., 183

route have not been successful. Simple oral administration of insulin itself is completely without effect, and rectal injections are also useless. It is not certain upon exactly what factors the destruction or non-absorption of insulin from the stomach and intestine depends, though the reaction of the gut contents undoubtedly plays a part. Recently R. Stephan has recorded his observations and results upon this subject.[2] He considers that for the absorption of insulin by mouth there requires to be both an absence of ferments in the stomach and a regurgitation of bile into the stomach, and that absorption can only occur from the gastric mucous membrane. He found that a combination of insulin with bile acids was not destroyed in the fasting stomach, and was absorbed as rapidly as is the insulin hydrochloride from the skin. He thus gives an initial dose (2 g.) of magnesium sulphate to clear the stomach, and then a preparation of insulin-desoxycholic acid, of which 1 c.cm. is equivalent to 20 units of insulin. This preparation, which is named cholosulin, he found to be more active when previously exposed to the action of ultra-violet light and when food is taken after its administration. M. Ottow[3] also speaks optimistically of his results with cholosulin, but, as was noted in THE LANCET of May 24th, 1930 (p. 1139), others have not had such satisfactory experience with this drug. A. Bratusch-Marrian[4] records failure after its administration in three young diabetics, and attributes Stephan's favourable results to a spontaneous improvement in tolerance which almost every diabetic shows when taken into an institution with careful regulation of diet. We have thus still to find a preparation of insulin which can act by mouth in the way that this hormone acts parenterally, and the results of other workers with the phosphotungstate precipitate will be awaited with interest.

A NEW DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS.

ANNOUNCEMENT has been made in our advertisement columns of a diploma in gynæcology and obstetrics to be awarded by the English Conjoint Board on the results of an examination to be held for the first time on Oct. 23rd. Any who intend to present themselves for this examination should inform the Secretary of the Examination Board now, as 21 days' notice is required. Candidates must have held for not less than three years a degree in medicine and surgery recognised by the Board or a qualification registrable in this country. The examination is written, oral, and clinical. Papers will be set on (*a*) gynæcology and obstetrics, including pathology, histology, and bacteriology; (*b*) antenatal, postnatal, and infant welfare work. Evidence is also required of having held a resident appointment in a gynæcological and obstetrical department or maternity hospital, and of responsible care of patients at antenatal, postnatal, and infant welfare clinics. These conditions may be modified at the discretion of the committee of management in the case of candidates who have carried out original investigations or who have had special opportunities of study, but exemption will not be granted from any part of the examination itself.

It may be recalled that the Royal College of Surgeons of England was empowered by its Charter of 1852 to appoint examiners for testing the fitness of persons to practise in midwifery and to grant licences of such fitness; but these examinations were discontinued in 1875. The Society of Apothecaries recently instituted a Mastery of Midwifery, denoting the possession of specialised knowledge of antenatal care, midwifery, and child welfare; and the University of Dublin (Trinity College) confers a diploma in gynæcology and obstetrics upon registered medical practitioners who have taken a special course at the Rotunda Hospital or other recognised institution, as well as a mastership in obstetric science which may be taken two years after the qualifying B.A.O. London University specifies midwifery and diseases of women as one of the branches for the award of its M.D. degree. The British College of Obstetrics and Gynæcology, founded last year, has power under its memorandum of association to grant diplomas, either alone or in coöperation with authorised teaching and examining bodies.

[2] Münch. Med. Woch., 1929, lxxvi., 1579; Med. Klin., 1930, xxvi., 228.
[3] Münch. Med. Woch., 1930, lxxvi., 1584.
[4] Ibid., 1930, lxxvii., 715.

PROF. H. B. DIXON.

Harold Baily Dixon, who died last week, had occupied for 36 years the chair of chemistry at Owens College in succession to Sir Henry Roscoe, who had held it for the previous 30 years. Both made big contributions to chemical science and to educational work in Manchester; they must, too, have moulded in considerable degree the thought of successive generations of medical students. Roscoe set a high standard of lucid lecturing. Dixon lectured to students who were also listening to Milnes Marshall and Arthur Schuster, but no one who sat under Dixon will forget his unquenchable enthusiasm as a teacher; his lectures were permeated with the spirit of inquiry, and students were led to consider the methods by which results had been obtained and the arguments upon which theories were based. Dixon's research work was coloured by the character of the industries by which he was surrounded. Just fifty years ago he made the discovery that explosive mixtures of gases do not explode when sparked unless a trace of water vapour is present. This work not only foreshadowed the theory of chemical go-betweens or catalysts but led Dixon on to measure the explosion wave in different mixtures of gases, and so to approach some of the complicated problems of explosion in coal-mines. He became a commissioner of coal-supplies and a member of the executive committee on Explosions in Mines (1911–14). Dixon's interest in education did not end with the lecture room and the laboratory; it was his aim to see that Manchester boys and girls had systematic instruction in branches of knowledge which had direct bearing upon the leading industries of the city and district, and as he was chairman of governors of several groups of schools he was able to put his aim largely into effect. He had resigned the chair of chemistry in 1922 but had carried on research in the University laboratory until the time of his death.

Prof. John Beresford Leathes, F.R.S., will deliver the Harveian Oration of the Royal College of Physicians of London at 4 P.M. on Saturday, Oct. 18th.

UNIVERSITY COLLEGE HOSPITAL.—The annual dinner of past and present students will be held on Friday, Oct. 17th, at 7 for 7.30 P.M., at the Hotel Victoria, Northumberland-avenue, London, W.C., with Mr. Herbert Tilley in the chair. Tickets may be obtained from the dinner secretary at the Medical School, Gower-street.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCVIII.—TREATMENT OF BREECH PRESENTATIONS.*

BREECH presentations are found in the antenatal period very frequently up to about the thirty-fourth week. After this time they are much more uncommon, owing to the fact that spontaneous version to a vertex occurs in a large proportion of cases from the thirty-fourth to the thirty-fifth week of pregnancy. For this reason it is unnecessary to interfere in any way earlier than the thirty-fifth week. In a small number of patients the hard head in the fundus causes pain from the thirty-third to the thirty-fourth week, and if version is done the pain is relieved; in such cases it is worth while to turn the child early simply for the relief of pain. In about 3 per cent. of all labours there is a breech presentation. The fœtal mortality in breech cases is nearly 10 per cent., the figures at Queen Charlotte's Hospital being 11 per cent. in primigravidæ and 8 per cent. in multigravidæ. The disadvantages to the mother of a breech labour are the greater risk of exhaustion from a long labour and greater liability for lacerations to occur.

It is important that every patient should have as easy a labour as can reasonably be achieved for her; and, since the fœtal risk is so definitely increased in breech labour, it is much the best practice to turn all breech presentations into vertex presentations before the onset of labour. In a primigravida the most satisfactory method of ascertaining the relative size of the child and the pelvis is by pushing the head into the pelvis and thus gauging the proportions of the head and pelvis. For this it is essential that the presentation should be a vertex, and this is, therefore, an additional reason for converting a breech into a vertex presentation in the antenatal period.

The ideal time for doing version in a primigravida is about the thirty-fifth week of pregnancy. As a rule at this time the presenting part has not yet descended deeply into the pelvis and time has been allowed for spontaneous version to occur. It is often possible to do version easily without anæsthesia, and this practice has the advantage that it prevents the obstetrician from using undue force. An anæsthetic may be necessary where the patient is unduly nervous or where the presenting part is deeply engaged. In such cases version is usually delayed until about the thirty-seventh week, in case the manipulations and anæsthetic should combine to bring on labour. I have never seen an untoward complication following version in the antenatal period.

Technique of Version.

In doing version the first manœuvre is to push the breech out of the pelvic brim fully, then to pull the head downwards towards the other side of the abdomen. The direction of choice is to push the head round towards the pelvis away from the back of the child. By this means the flexion of the child will not be disturbed. When version fails by pushing in this direction, the other direction can be tried and often succeeds without harm ensuing. The Trendelenburg position is a useful preliminary to version where the presenting part is engaged. After version the head will often sink low into the pelvis; but if this does not occur a binder is applied and the patient is seen in a week's time. The use of a binder is particularly to be recommended after version in a multipara, where the abdominal wall is often weak, and, therefore, the breech presentation is liable to recur. In a multipara the version is generally done at a later date than in a primipara—generally about the thirty-seventh week. There is no harm in doing it earlier, but there is a greater tendency for the presentation to recur than in a primigravida.

Failure to effect version is often due to extension of the legs of the child, or to the fact that the breech is so deeply engaged in the pelvis that it is impossible to move it. After failure to turn has occurred in a primigravida it is instructive to have an X ray photograph taken in order to ascertain exactly the position of the child.

PRECAUTIONS IN DIAGNOSIS.

Great care is needed in antenatal palpation to avoid the mistake of diagnosing a vertex presentation when in reality an extended breech is present. In order to avoid this mistake, the following points must be remembered: (1) The presenting part feels smaller and is more conical than the head would be, and no sulcus can be felt (as between the head and the shoulders). (2) The head in the fundus feels harder than the breech would feel, and small parts are felt near it. (3) The whole uterus is narrower from side to side than in a vertex. (4) On vaginal examination the presenting part is softer than the head would be.

In spite of great care in examination it is very easy to make this mistake; if there is any doubt an X ray photograph will settle the diagnosis.

Where Version has Failed.

In conducting a labour where version has failed, it is advisable to keep the patient lying down in the first stage, since early rupture of the membranes is very liable to occur. The labour should be allowed to proceed naturally, and there should be no undue hurry. In the second stage the patient should be encouraged to bear down as much as possible. As soon as the breech is completely born, the legs are gently brought outside the vulva and the legs and breech wrapped in a warm sterile towel. It is very important not to pull on the legs at all. The part of the child which is born is held in the hands and the cord is pulled down a little, so that its pulsation can be observed. As soon as the edge of the ribs appears two fingers of the right hand are passed up the side of the child, to make out whether the arms are extended or not. It is advisable not to push on the fundus until the arms are born, as this is likely to cause extension of the arms.

If the elbows are felt easily, the arms are cautiously brought down, and when the next pain occurs the assistant pushes on the fundus, and the shoulders are born. The head then sinks into the pelvis. If this does not occur at once extra pressure is exerted on the fundus and will usually push the head into the pelvis. After the head is in the pelvis the child is turned, so that its back is upwards, and the child is then delivered by drawing the child's legs up over the patient's abdomen. Firm suprapubic pressure is used at the same time to aid delivery.

If the head is delayed it is necessary to extract it as quickly as possible. Occasionally the delay is due

* An article in this series by Miss Dearnley, on the Treatment of Posterior Positions of the Vertex, will appear in a future issue of THE LANCET.

to the fact that the dilatation of the cervix is not quite complete. If the cervix is felt over the forehead of the child, it should be pushed up at once, when the head will descend. If the head does not descend and no rim of cervix is felt, the child is pulled downwards and backwards, suprapubic pressure being kept up until the head descends into the pelvis. In other cases, where the delay is in the pelvic cavity, the child can be delivered by passing one hand along its chest until a finger can be put in its mouth; traction is then exerted in a forward direction—changing into an upward direction, whilst firm suprapubic pressure is exerted.

In some cases the following grip is most effective where the delay occurs at the brim. The left hand is passed under the child along the front of the chest—the second finger is put in the mouth and the first and third fingers on the clavicles. The right hand is placed along the back of the child, and the first and second fingers are placed over the shoulders. The child is drawn downwards and backwards—flexion of the head being promoted at the same time. The assistant at the same time makes firm fundal pressure. When the head has entered the pelvic cavity the back of the child is turned to the front and delivered as described previously.

It is the custom to have forceps boiled and ready for use in all cases of breech delivery, and in a small number of cases it is possible by this means to deliver the child alive where otherwise it would be dead. In applying forceps to the after-coming head it is of great importance to hold the child's body well up towards the mother's abdomen, so as to be able to apply the forceps correctly.

Breech Presentations with Extended Legs.

In a few cases in which the child is small and the pelvis normal, delivery of a child with legs extended is possible. Unfortunately this is not possible, and it is unwise to wait in the hope that it will prove so. Unless the labour is progressing unusually quickly, it is most dangerous to wait at all. It is generally held that as soon as dilatation of the cervix is practically complete an anæsthetic should be given, and that one or both legs should be brought down. If possible both legs should be brought down as this renders the subsequent delivery easier. No traction should be exerted on the legs or extension of the arms will result. As there is an additional risk of extension of the arms after any interference, an examination is made as soon as the costal margin of the child is born, and if the arms are found to be extended they should at once be brought down. The omission to do this is the most common reason for losing the child. If the arms are lying extended by the side of the head, or with the elbows flexed and the forearms in front of the face, it is best to bring down the posterior arm first, as there is more room in the hollow of the sacrum than in front. The hand is passed into the pelvis until the fingers lie along the forearm of the child. By pressing on the forearm the elbow is flexed, and the arm swept over the child's face. The anterior arm is brought down in a similar manner. In some cases where it is found impossible to reach the anterior arm, it is necessary to rotate the child so as to bring the arm posterior before bringing down. The rotation should be towards the side where the back lies, otherwise a dorsal displacement will occur. If a dorsal displacement of the arm is found, the child must be rotated towards the side where the back lies so as to rectify this to some extent, and then the arm is brought down manually as above. In some cases of extended breech in a primigravida, where there is difficulty in delivering owing to a tight perineum, a timely median episiotomy will be the means of saving the child.

In all cases of breech delivery it is common to deliver a child which is more or less asphyxiated, and adequate means of resuscitation should be prepared for this.

GERTRUDE DEARNLEY, M.D., B.S. Lond.,
Gynæcological Surgeon, Royal Free Hospital; Physician to Antenatal Department, Queen Charlotte's Maternity Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lts. E. J. K. Weeks and W. J. Rankine to be Surg. Lt.-Comdrs.

The following appointments are notified: Surg. Lt.-Comdrs. (D.) F. W. Paul and T. E. Brevetor to *President*, for three months' dental post-graduate course.

Surg. Lt. G. D. J. Ball is transferred to the Permanent List.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. E. E. D. Gray to *Repulse*. Proby. Surg. Lt. R. St. J. Lyburn to *Concord*. Proby. Surg. Sub-Lt. W. E. Thomas to *Malaya*.

ROYAL ARMY MEDICAL CORPS.

Maj. (temp. Lt.-Col.) D. M. Corbett to be Lt.-Col., vice Lt.-Col. G. E. Cathcart (decd.).

Maj. W. J. E. Bell to be temp. Lt.-Col.

Capt. C. A. Whitfield to be Maj. (prov.).

TERRITORIAL ARMY.

Maj. H. Forrest to be Lt.-Col.

INDIAN MEDICAL SERVICE.

Maj.-Gen. G. Tate retires.

DEATHS IN THE SERVICES.

Col. Charles Mactaggart, M.B., C.M. Glasg., C.S.I., C.I.E., late I.M.S., who died at Campbeltown, Argyllshire, on Sept. 17th at the age of 69, was the son of Charles Mactaggart of that place. He received his early education at Campbeltown Grammar School, and in 1885 graduated in medicine and surgery, with commendation, at the University of Glasgow. In the following year he entered the Indian Medical Service and was in military employ till 1889, when he was transferred to the civil side of the United Provinces, and was successively superintendent of the central prisons at Benares, Agra, Allahabad, and Lucknow. In 1902 he became inspector-general of prisons, and in 1907–08 he was made a member of the Indian Factory Labour Commission. Subsequently he was made a member of the provincial legislature, and afterwards became inspector-general of civil hospitals of the United Provinces. In 1917 he was selected as president of the provincial Medical Council, and retired in 1920. He received the C.I.E. in 1911 and the C.S.I. in 1919.

DONATIONS AND BEQUESTS.—Miss Mary Reid, of Port Glasgow, left £6000 to the Greenock Eye Infirmary.—The Nottingham General Hospital has received £1500 as a result of the University College students' efforts on behalf of local medical charities.—Among other bequests, Mr. R. J. Rowat, of Glasgow, left £1250 to the Royal Alexandra Infirmary, Paisley, to endow a bed in the name of his father.—Mr. Arthur K. Meyers, of Brighton, bequeathed the whole of his property, £6033, to the Royal Earlswood Institution for Mental Defectives, Earlswood, Surrey.

BIRMINGHAM CONTRIBUTORY SCHEME.—Since the beginning of the present year the membership has increased from 366,000 to over 400,000. During the first half of the year more than 10,500 contributors and their dependents have been treated as in-patients; the out-patient attendances at the voluntary hospitals and the General Dispensary have been approximately 300,000. The district nurses have paid nearly 90,000 visits and £70,000 has been distributed among the local institutions. More than 1000 voluntary officials organise and conduct branches of the scheme in the city and surrounding districts.

PUBLIC HEALTH SERVICES

PORT SANITARY AUTHORITIES.

BRISTOL.

In his report to the sanitary authority for 1929, Dr. R. A. Askins mentions that 1021 ships arrived at the Bristol ports from foreign countries, 7136 coastwise. Of these 171 were visited by the medical officer, 2478 by sanitary inspectors. There was no case of cholera, yellow fever, small-pox, typhus, or plague. Four rat-catchers now work under the medical officer, all ships and buildings about the docks being examined systematically; 704 rats were destroyed on vessels, 5023 in docks, quays, and warehouses. Of these, 95 from ships, 177 from the shore, were examined and found free from plague. There is a refuse tip near the docks which harbours rats in spite of palliative measures; 8200 poisoned baits were laid here in May and June, but only 102 dead rats were found. Of 2478 vessels examined, 487 had sanitary defects (nature unspecified); all but two had them remedied before leaving. Thirty cases of venereal disease were received from ships and 152 cases were seen in the port clinic. Two cases of grain dermatitis, caused by a mite *Pediculoides ventricosus*, occurred in men handling barley from Saffi, in North Africa. The water-supply of the port is from the city hydrants, and in Bristol docks from a water boat, regularly inspected and cleaned. Seven samples from ships were examined and six were suspicious. Of bananas, 119,275 tons were imported more than through any other European port.

TYNE PORT.

In his report Dr. W. E. Harker mentions that of the 10,608 vessels reaching the Tyne, 9495 were inspected. Cases of diphtheria, malaria, scarlet fever, chicken-pox, and typhoid were landed; no case of plague, yellow fever, small-pox, or tubercle came to notice. Inspection showed the existence of 1119 nuisances and 1601 structural defects, including 118 verminous forecastles. Dirty crew-spaces to the number of 1043 were found, and were apparently remedied. The rats examined numbered 1900, none of them plague-infected; 1368 in 108 ships fumigated with sulphur, 2 in 8 ships fumigated with hydrocyanic acid, 530 in 20 ships dealt with by trapping methods. The food imported was generally in good condition; only 1 case of game, 5 cases of cod's roe, and 7 boxes of plaice were condemned. The tanks of 17 ships were cleaned. Leaflets on venereal disease and the facilities for treatment at the local clinics are distributed on board.

MENTAL HOSPITAL REPORTS.

THE RETREAT at YORK publishes a report illustrated as usual by charming pencil drawings and recording a busy year of work. There were 220 patients on the books at the end of December, and 63 per cent. of the 135 admitted during the year came on a voluntary basis. The death-rate was 8·5 per cent. The new property at Garrow Hill will be available for uncertified cases in a few months. The work of the occupations department increases in value and interest, and is demanding larger accommodation. A significant alteration during the year was the conversion of the last padded room into a modern bathroom. A new nine-hole golf course has been laid out. The medical superintendent discusses fashions in research and treatment, and the application of modern psychology to mental cases. Ultra-violet light therapy and general daily massage are being given a careful trial. Twelve nurses obtained their R.M.P.A. certificate during 1929.

The SCOTTISH WESTERN ASYLUMS' RESEARCH INSTITUTE publishes an outline of its history in its twentieth annual report, and once again the financial position provides a subject for grave concern. Expenses have been reduced to a minimum, and no new equipment has been added during the year. A total of 903 specimens has been examined, a very large number being from cases of general paralysis. The general conclusion is that malaria gives better results than any other form of treatment, but the benefit is enhanced by a subsequent course of tryparsamide. The laboratory provides post-graduate instruction, and a certain amount of research has been carried out on the blood-sugar reaction to insulin in the psychoses and on cases of Alzheimer's disease.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 13TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 75 (last week 106); scarlet fever, 1615; diphtheria, 1215; enteric fever, 65; pneumonia, 441; puerperal fever, 56; puerperal pyrexia, 85; cerebro-spinal fever, 7; acute poliomyelitis, 21; acute polio-encephalitis, 1; encephalitis lethargica, 22; continued fever, 1; dysentery, 11; ophthalmia neonatorum, 89. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 16th–17th was as follows:—Small-pox, 216 under treatment, 1 under observation (last week 216 and 4 respectively), scarlet fever, 1641; diphtheria, 1384; enteric fever, 29; measles, 120; whooping-cough, 113; puerperal fever, 27 (plus 13 babies); encephalitis lethargica, 118; "other diseases" 35. At St. Margaret's Hospital there were 19 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (2) from enteric fever, 11 (2) from measles, 2 (1) from scarlet fever, 11 (0) from whooping-cough, 27 (6) from diphtheria, 55 (11) from diarrhœa and enteritis under two years, and 12 (2) from influenza. The figures in parentheses are those for London itself.

The deaths from enteric fever outside London occurred at East Ham and Sheffield. Liverpool reported 2 deaths from measles, Birmingham 2 from whooping-cough. Five fatal cases of diphtheria occurred at Liverpool, not more than 1 at any other large town. Seven deaths from diarrhœa were reported from Liverpool, 4 from Newcastle-on-Tyne, 2 each from Hendon, Birmingham, Coventry, Nottingham, West Hartlepool, and Gateshead.

The number of stillbirths notified during the week was 275 (corresponding to a rate of 42 per 1000 births), including 52 in London.

A DEVON CANCER BED.—An attempt is being made in Devonshire to raise £2000 for the endowment of a "Devon Bed" in the Marie Curie Hospital. The endowment would entitle women from the county to free treatment, and over £300 has already been raised.

JOINT HOSPITAL FOR SHETLAND.—The Scottish Department of Health has suggested the creation of a new 60-bed hospital at Lerwick for acute surgical, medical, and maternity cases. The total estimated cost is £54,000. The Department considers that £16,200 might be provided under the statutory services, but the remaining £37,800 would have to be made up by the Gilbert Bain Hospital Trustees and the Highlands and Islands Medical Service Fund. The proposal has now been approved by the Shetland County Council. The Gilbert Bain Memorial Hospital at Lerwick has become totally inadequate for the needs of the island.

CORRESPONDENCE

STEREOSCOPY OF X RAY FILMS.

To the Editor of THE LANCET.

SIR,—On my return from the Joint Tuberculosis Council Canadian Tour, I think it well to make the following comment on a subject which gave rise to considerable and keen discussion at almost every medical gathering in which we had the honour and pleasure to take part. I refer to the supposed value of the application of the principle of stereoscopy to the examination of X ray films.

The appearance of solidity obtained by the observation of stereoscopic photographs with both eyes involves the use of a little understood process, by which the brain fuses the images received on each retina into one image, which has an entirely new attribute of distance or depth. If we perform the simple experiment of looking at a drawing-pin point uppermost, we shall see a circle of brass with a pin taking up the position of the radius of the circle. If the pin is immediately in front of the observer, with the left eye the image of the pin appears to the right of the vertical, with the right eye to the left of the vertical. With both eyes in use the pin is seen to assume a medial position carrying with it a correct impression of its relation to the head of the pin, though we are well aware that neither retina receives the image as seen by binocular vision.

Wheatstone first explained the use of the stereoscope in the beginning of the last century, and by means of this instrument two dissimilar plane images are placed in sufficient proximity to allow them to fall on homologous points on the two retina so that fusion takes place and an impression of solidity results. Appreciation of distance is so important that this faculty of fusion of images is in constant daily use. Small wonder, then, that the use of a stereoscope requires very little practice, and that on the first occasion on which a stereoscope is used it conveys what is intended—an impression of solidity.

But in order that this solidity should be a recapitulation of the solidity of the object of which the plane stereoscopic image is a representation, this image must contain a record of the perspective of the original object. That is to say, it must be a diagram or a photograph, and not the mere shadow of some three dimensional object on a plane surface. Everyone is familiar with pictures of a series of similar objects each diminishing in size until they disappear into infinity. Two photographs of such a series would form an excellent pabulum for the production of a solid image in a stereoscope, but the X ray record of such a series would result in a large image of the object furthest from the film and a small image of the object in close apposition to the film.

Now when this film is examined in a stereoscope, the largest shadow gives the impression of proximity and the small shadow of distance, and thus the solidity is reversed. It is true that an impression of solidity can be obtained by the stereoscopic examination of X ray films, but it is obviously impossible for this impression to convey a true indication of the three dimensional relationship of the objects whose shadows are recorded on the films. If X rays were amenable to refraction as light waves are, this might be another story.

At present all we are doing by the observation of X ray films in a stereoscope is to use a series of shadows to create an illusion, and because it is an illusion which we have all used daily since birth we are inclined to accept the result without question.

I am, Sir, yours faithfully,

LEONARD STOTT,
Assistant Medical Officer, Papworth Village Settlement.

Cambridge, Sept. 17th, 1930.

TREATMENT OF PULMONARY TUBERCULOSIS IN SWITZERLAND.

To the Editor of THE LANCET.

SIR,—I hope you will allow me to reply to the letters provoked by my reflections of July 19th. Statistics, as the President of the Royal College of Surgeons has put it, "can be made to show anything, even the truth"; thus while the meteorological figures quoted have no doubt demonstrated a bald truth, that Switzerland has more sun in winter than England, the inference that therefore Switzerland has the advantage over England as a place to treat phthisis is not justified. If the high Alps are more healthy than England we should expect the natives of those parts to be of finer physique than the natives of England, which is not so—in fact, quite the reverse.

Dr. Amrein, writing from Switzerland, refers to our climate in terms of a sunless, treacherous, misty, and damp winter, and I notice to my sorrow that he is supported in this error by an Englishman, Dr. Banks, and also by the patient of "M.R.C.S." On some people, a bad day in England seems to make an indelible impression, so that they imagine the weather is always bad. Similarly, some people "always" just miss the 'bus, or "always" find a lost article in the last pocket searched. Yet these people who run down their own climate will tolerate appalling weather in Switzerland with equanimity, presumably because they have been taught that the Swiss weather is always good. If Dr. Banks believes, as his letter seems to imply, that patients can get, or usually do get, medical and surgical treatment in Switzerland superior to that at home, he has a reason which might well outweigh all others in impelling him to recommend Switzerland; but I do not think the belief is common. The majority of medical men who have recommended Switzerland have done so, I think, from climatic considerations, and it is on this point in particular that English-informed opinion is undergoing a change. Montana has been specially mentioned in this correspondence. I have visited Montana and I can agree that, owing to its peculiar situation, the facilities for walking exercises are moderately good, and also that it is a quiet little town; but in the main (and surely it is no crime to make a modest generalisation) Montana conforms to the generality of other Swiss resorts situated at similar altitudes.

I am surprised to read that Dr. Hudson would have us regard the commercial success of the Swiss régime as proof of its efficacy. One can imagine a layman basing his judgment on this consideration, but every doctor knows how worthless this may be. I do not say that good results of treatment are not obtained in Switzerland—any place almost may show good results provided the doctors in charge understand their work; but I do believe the task imposed on doctor and patient is more difficult if undertaken in Switzerland than in England, and I am very pleased to read that

no less an authority than Dr. Vere Pearson holds the same opinion. Dr. Pearson calls our attention to the pronouncement of Sir Henry Gauvain in which the latter explains that a healthy climate is one which possesses frequent changes of weather from warmth to coolness, and sunshine to shade (the very qualities, in fact, that we enjoy in England both summer and winter), and that patients soon cease to react beneficially to prolonged weather of one type. An instance of the truth of this teaching is clearly seen in the case of the white man forced to live in the tropics, where sunshine and ultra-violet light ad nauseam do not maintain him in a high plane of health, and do not protect him against tubercle.

In England we have a generous, varied, and interesting climate. We have a medical tradition of sound learning and honourable practice as strong to-day as ever before. Why, then, as Dr. Davis asks, should we "banish our phthisical patients to a foreign country where home comforts and familiar ways are absent"? That there are reasons for not doing so I hope I made clear in my article.

I am, Sir, yours faithfully,

W. R. E. HARRISON.

Alexandra Hospital, Swanley, Kent, Sept. 22nd, 1930.

THE MEDICAL TREATMENT OF CANCER.

To the Editor of THE LANCET.

SIR,—My letter in your issue of Sept. 13th (p. 611) pointed out that, within a week of my provisional announcement of the use of lead selenide in the treatment of cancer, Prof. Blair Bell wrote a letter suggesting priority. Although there is no mention of selenium in his writings prior to the date of my article—i.e., March 12th, 1927—he has, until last week, regarded colloidal lead selenide simply as a variant of his "colloidal" lead treatment. Of a set purpose, but with absolute truth, my letter of Sept. 13th stressed my opinion as to the relatively greater importance of selenium; Prof. Blair Bell writes immediately to claim priority as regards this discredited element also. I think that his own writings are the best evidence as to the truth; particular attention should be paid to his dates.

Prof. Blair Bell has left the record: "For a time," he wrote,[1] "we used a suspension of lead selenide, but this appeared to be almost too stable to give good results, although it is not inert; it is, however, singularly atoxic. Lead selenium has, however, been successfully employed *by Dr. Todd, of Bristol, who was the first to make and use this preparation of lead.*" [The italics are mine.] Here he definitely affirms that I first made and used lead selenide. Now, as I have said, I published the first account of the use of lead selenide in your columns[2] on March 12th, 1927. In the very next issue of THE LANCET, a letter appeared from Prof. Blair Bell stating that his chemists had had no difficulty in making lead selenide; but what had been a "suspension" in 1929 improved and became an "excellent colloid" in the repetition of his letter of 1927 which appears in your issue of last week (p. 667).

Still further complications emerge from this last letter, for now Prof. Blair Bell says: "However, for the information of Dr. Todd, I may say that we commenced the manufacture of lead selenide *in October, 1926* [italics mine]. . . . We found, as I have said before, that this preparation is of little value. . . ." Since Prof. Blair Bell himself affirms that I was the first to make and use lead selenide—i.e., March 12th, 1927—I am unable to understand how he prevailed upon his chemists to make it in October, 1926, and I cannot see how he was able to treat a patient (Case R.I. 70[1]) with this preparation in February, 1927.

I am, Sir, yours faithfully,

Bristol, Sept. 20th, 1930. A. T. TODD.

[1] Brit. Med. Jour., 1929, i., 432, et seq.
[2] THE LANCET, 1927, i., 575.

PRURITUS ANI ET VULVÆ.

To the Editor of THE LANCET.

SIR,—I have read with interest the letter on this subject in your issue of Sept. 13th by L. F. R. Knuthsen and Howard Humphris, and I note that they strongly advocate the use of X rays in the treatment of this condition.

I feel very strongly that this statement should not be allowed to go unchallenged. My own experience, which is not inconsiderable, is that X ray treatment is very dangerous in these cases. I have seen some terrible results from X ray burns in the anal region during the last 15 years, and consider such treatment quite unjustifiable in view of the risks involved. I have seen two cases of rapidly developing epithelioma as a direct result of X ray treatment for pruritus ani, and in both cases extensive resection of the parts had to be performed in an effort to save the patients' lives. In a number of cases I have had to treat bad burns, which have caused months of suffering. These results were not always due to careless or inexpert administration of the rays, as some of these patients had been treated for pruritus by men whom I know to be thoroughly expert in the use of rays. There would seem to be a special liability for the skin in the neighbourhood of the anus to undergo X ray burning in certain persons, and this liability cannot be estimated or allowed for.

While undoubtedly cures can sometimes be effected by the use of X ray application, I consider the risks are so great that the treatment is unjustifiable. No such risk is involved in operative procedures. The risk also of sterilising young persons is not so easily or certainly avoided as the authors would have us believe. The bad results from X ray treatment for very obvious reasons do not get reported, but I have seen too many of these results, and I feel strongly that the profession should be warned that they do occur.—I am, Sir, yours faithfully,

J. P. LOCKHART-MUMMERY.

Hyde Park-place, W., Sept. 19th, 1930.

COG-WHEEL BREATHING.

To the Editor of THE LANCET.

SIR,—I was extremely interested in Dr. Hebert's article in your last issue (p. 628), as it agrees so fully with the theory I have tried to place before younger members of the profession and students when giving instructions here in physical signs—except in one point. In cases of congestion of small areas of the lung, as in tuberculous lesions, one can almost invariably find the vocal fremitus increased; may not the sound produced by the systole of the heart, in suitable cases, be equally well conducted to the stethoscope with the abnormal breath sounds? I have frequently put this forward as one of the causes of so-called cog-wheel breathing on purely

theoretical grounds, without the scientific proof which Dr. Hebert has applied in his cases; and I think it is worthy of consideration.

I am, Sir, yours faithfully,

A. ADAMS, M.D.,
Medical Superintendent, Liverpool Sanatorium,
Sept. 23rd, 1930. Frodsham.

A PERVERSION OF TASTE.

To the Editor of THE LANCET.

SIR,—I was recently called in by a colleague to give an opinion in what proved to be a case of cerebellar tumour. Beside the more or less usual focal symptoms was one that I have not previously encountered in this connexion. The patient found that everything given, solid or liquid, tasted sweet. A cerebellar growth extending forward to the pons and involving the seventh nerve would have to be much more extensive than was the case here, and, moreover, abolishes the sense of taste altogether, with, I believe, no more than a temporary perversion. if indeed any. This patient's abnormal taste sense was definite and constant for both anterior and posterior lingual surface and persisted till the end. Of course, anyone having had special experience amongst the insane and mental defectives is familiar enough with taste perversion and more particularly in the psychosis of general paralysis; personally I have twice only met with the special perversion alluded to, and then it was transient and not very pronounced. One case was a general paralytic; the other an elderly and somewhat demented alcoholic patient. The parageusia of the pellagra sufferer is, as far as I can learn, always the *mal salso*, and I only refer to it as an instance of special and consistent alteration of taste. I shall be very grateful for any enlightenment on this particular case and for any information on the subject of taste perversion.

I am, Sir, yours faithfully,

Whitehall Court, S.W., Sept. 21st, 1930. G. AUBREY.

PANEL AND CONTRACT PRACTICE

Cost of the National Service.

FIGURES given [1] by the Minister of Health indicate the extent and cost of the insurance medical service in England in 1929. There were 14,600 doctors in insurance practice. Medicines and appliances were supplied as part of medical benefit at about 9000 chemists' shops. The number of insured persons entitled to medical benefit was a little over 14,000,000. Medical benefit cost over £8,666,000. Of this sum panel doctors received over £6,256,000 in respect of their duties of attending and treating insured persons; and £1,922,800 of the balance was paid to panel chemists for the supply of drugs and appliances. About £200,000 was paid to country doctors on account of mileage—i.e., in practices where the physical conditions are such that distances covered are not in themselves a fair measure of the doctors' difficulties. Nearly £10,000 was set aside to enable country doctors to attend courses of post-graduate study, and to provide them with facilities such as maintenance of telephones, motor-cars, and branch surgeries. Doctors received about £194,800 for medicines and appliances supplied by them as part of emergency treatment, for medicines administered by them personally, and for medicines dispensed by them in country districts where patients are out of reach of chemists. Finally sums of about £71,000 and £11,000 were paid on account of insured persons who elect to obtain treatment (including medicines) through approved medical institutions, or with the consent of insurance committees to make their own arrangements for treatment.

Investigation of Prescribing.

Last year regional medical officers of the Ministry of Health paid 1325 visits (125 more than in 1928) to doctors whose prescribing appeared to call for explanation, and this exchange of view, Mr. Arthur Greenwood tells us in his report just issued,[1] enabled him in the great majority of cases either to accept the explanations tendered by the doctors, or to satisfy himself that minor departures by the doctors from a reasonable standard of prescribing would not recur. In about 145 cases the Minister informed the doctors concerned that while it appeared to him that, notwithstanding their explanations, there was a prima facie case for referring the matter to the panel committee, he would refrain from doing so because he was satisfied of their intention to prevent any question of such reference from arising in the future. In 16 cases (against 31 in 1928) it was referred to panel committees to find whether the prescribing had imposed charges on the available funds in excess of what was reasonably necessary, and, if so, of what amount.

In 11 out of 12 of these cases in which the panel committee's findings were available before the end of the year, and in five out of the six cases outstanding from last year, panel committees found that an excess cost had been so imposed during the quarterly periods which were the subject of investigation. In 14 cases the estimated amounts of excess cost found by the panel committee varied from so small a sum as £1 1*s*. 5½*d*. to £100. In two cases the committee made no findings as to the amount of the excess cost imposed, and in the remaining two cases the committee found that there had been no excess cost.

One appeal was made by a doctor against the panel committee's decision; in six cases the Minister was dissatisfied with the committee's findings; and in two cases both the doctors and the Minister, on different grounds, decided to carry the matter further. In these nine cases three medical men, independent of the Ministry, were appointed by the Minister to act as referees on the points at issue. In one case the report of the referees was outstanding at the end of the year. In seven of the eight cases dealt with by them the referees reported that excess costs, varying in amount from £5 5*s*. 0*d*. to £150, had been imposed upon the available funds by the doctors' prescribing. In one case the referees concurred with the finding of the panel committee that no excess cost had been imposed. In the one case outstanding at the beginning of the year the referees reported that an excess cost had been imposed.

After considering the recommendations of insurance committees made in the light of the findings of panel committees or referees, or both, and giving the doctors concerned an opportunity of making oral or written representations, it is, says Mr. Greenwood, his duty to decide what amount of money, if any, it is equitable to withhold from the remuneration of the doctors concerned, on the ground that they have prescribed in such a way as to throw upon the available funds a charge in excess of what was reasonably necessary for the adequate treatment of their insured patients. Actually he withheld money under this procedure in

[1] Eleventh Annual Report of the Ministry of Health, 1929–30. Cmd. 3667. H.M. Stationery Office. 4*s*. 6*d*.

22 cases, the sums withheld ranging from £5 to £150, and amounting in all to £643 10*s*.

Limiting the Cost of Prescriptions: Effect on the Patient.

A practitioner in the Home Counties writes:—

"There has recently been a good deal of perturbation regarding the activities of the Ministry of Health in their endeavours to keep down the cost of panel practitioners' prescriptions. One aspect of the matter has not, I think, received the attention that is its due. This is the effect on the patient, for whose benefit after all the whole scheme of national health insurance exists. Let us consider how the present state of affairs affects him.

"It is now, I believe, the custom for doctors whose prescriptions are above the average to be visited by an official from the Ministry of Health who demands details and reasons both generally and in regard to individual prescriptions. This, with its implied threat of a heavy fine (and recent occurrences have shown it to be no idle threat), involves a considerable amount of worry and anxiety to the doctor. The result is obvious. In a number of cases the doctor determines that whatever happens he will not be so worried again, and proceeds ruthlessly to cut down all prescriptions. This has two effects. One is in operation now, and is that the patient may be deprived of actual necessary treatment by a doctor whose thoughts are on his averages. The other, which is really more serious for the patient in the long run, is the influence of this restriction on the doctor's mind; so that from being a keen enterprising man always on the look out for new and useful treatments he is in danger of becoming a mere drudge whose sole object is to secure a living.

"I do not think that this picture is overdrawn. I feel that it represents only too well what is beginning to happen to me and my patients. If it is not overdrawn, then, I think, one may fairly say that we are not doing our duty to the public unless we tell them plainly the facts of the case. It should not be forgotten that panel practitioners as a body hold a very important and responsible trust in regard to the treatment of a considerable proportion of the population of the country."

Departmental and Legal Standards.

The Minister of Health continues to issue the reports of inquiry committees constituted under Part VI. of the National Health Insurance (Medical Benefit) Consolidated Regulations, and his decisions thereon. It is instructive to compare the departmental standard expected of the panel practitioner with the legal standard enforceable in either civil or criminal proceedings in a court of law.

In a recent case where the Middlesex Insurance Committee alleged neglect of a panel patient, the facts were found as follows. A general labourer, aged 25, was taken ill on May 12th, 1929. In the previous week he had been bitten on the cheek by an insect; on May 12th he also complained of pain in the side. On May 13th he did not go to work, but visited the respondent practitioner, who gave him a prescription for a tonic and advised him to continue poulticing his cheek which the patient had already been doing. The patient took the medicine, went to bed, and by the evening became somewhat comatose. Next day (the 14th) he was obviously worse; his mother sent at 5 P.M. for the practitioner, who arrived shortly before 6 P.M. The practitioner, according to the Inquiry Committee's findings, "made a somewhat cursory examination of the patient: the pulse was felt but there was no taking of the temperature or sounding of the lungs." As to the pain in the side, the practitioner offered no definite opinion, but hazarded the suggestion that it might be due to pleurisy; he promised to call next day. The patient grew worse; next day he complained of severe headache, and the inflammation from the bite spread from the cheek to round the eyes; he was also becoming more drowsy. The respondent practitioner did not appear; the mother, being extremely anxious, sent her daughter with an urgent summons for him at about 8 P.M.; he came shortly before 10 P.M. On this occasion again, says the Inquiry Committee's report, no proper physical examination was made beyond taking the pulse. He told the mother the condition of continued pain in the side was very serious, and he would make arrangements for the patient's removal early next day to the hospital. At night the patient was very seriously ill and delirious. Early next day (the 16th) the mother sent for another doctor, who recommended immediate removal to the hospital. The respondent practitioner did not call on this day. In the early afternoon the patient was removed to Isleworth Hospital; he died before midnight. There was no post-mortem examination; death was certified as due to facial erysipelas and meningitis.

Upon these facts the Inquiry Committee finds "negligence of a somewhat serious character" in (*a*) inefficient and insufficient examination of the patient at the two visits (and in particular, the omission to use thermometer or stethoscope); (*b*) the failure to call on the 15th until the evening (the Committee says the patient's condition on the 14th warranted the respondent's attendance on the 15th without special summons); and (*c*) the unexplained failure to arrange for the removal to hospital (as promised) in the early morning of the 16th. At the same time the Inquiry Committee observes that the charges related to one patient only out of a panel list of about 2500—a number which, it is hinted, may have some relevance to the amount of attention the practitioner could give to each individual. There was no general charge of negligence or prejudicial conduct. The respondent himself was in bad health at the material dates. On the 16th he was visited by a fellow-practitioner, who found him suffering from congestion of the lungs, and recommended him to stop work. On the 16th the practitioner instructed his bookkeeper to communicate with another fellow-practitioner to see his patients for him; but the message, if sent, was ineffectual. It is clear from a letter written by a reputable insurance company—which evidence the Inquiry Committee mentions with a caution unnecessary in what is after all only a quasi-judicial tribunal—that the respondent received compensation for incapacity for the period from April 18th to May 2nd. The Inquiry Committee justly states that the patient's death cannot be directly attributed to the act or default of the respondent; the patient's condition may have presented complicated and unusual features, and the deceased might not have responded to the most careful treatment. From the point of view of criminal proceedings before a jury, the absence of a post-mortem report would have been decisive; a genuinely judicial tribunal cannot penalise a practitioner upon hypothetical grounds. The respondent, however, was not being tried for manslaughter or sued in damages for neglect. He was faced with a complaint that he had not maintained the standard expected of a panel practitioner. The Inquiry

Committee finds the Insurance Committee's complaint justified and recommends that the practitioner be made to pay the taxed costs of the inquiry. The Minister's decision embodies this recommendation, and adds a fine of £50 in the usual form of withholding that sum from monies payable to the Insurance Committee and deducting the amount from the practitioner's remuneration. Two other points may be mentioned. The respondent asked for an adjournment at the opening of the inquiry, but this was refused apparently on the ground that he had made no earlier communication to this effect. He may have been at some disadvantage in consequence. Practitioners in a similar position may note that it is well to give early notice of a desire for a postponement; otherwise the Insurance Committee's witnesses attend and all is ready, and the inquiry at that stage cannot be adjourned without inconvenience. The second point is that there was an allegation that the respondent was drunk or under the influence of drink when he visited the patient on the night of the 15th. The Inquiry Committee's report acquits him of this grave charge for which there was evidently no ground. It seems unfortunate that charges relating to events in May, 1929, were left undisposed of till July, 1930.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

THE LEGAL POSITION OF THE SURGEON.

THE problem of surgical interference, as viewed by the law, was recently discussed by Prof. Fritz Reuter at a meeting of the Medical Union of Graz. The law requires that before an operation the patient should give his written or oral consent. As a rule, the patient or a responsible member of his family is advised of the necessity of an operation, and, if he agrees, this is taken as valid consent. In certain instances, especially if the operation may necessitate removal of important structures or organs besides the one manifestly diseased, the surgeons, even in hospitals, are accustomed to obtain written permission to operate according to their best knowledge, so far as they find it necessary, even if a mutilating operation is required. Of late an additional factor has been brought into action by the frequent performance of sterilising operations on both sexes. It may be pointed out here that the Austrian law distinguishes two kinds of operations in this respect: sterilisation and castration. The first group comprises operations which spare the inner secretion and the faculty of cohabitation, while the second group comprises those which destroy all the functions of the sexual glands. Prof. Reuter pointed out that the indication for operation is or may be triple: medical, social, and eugenic reasons are recognised, but the last two are as yet not distinctly worked out. All authors of medical legislation agree that the faculty of fecundation is a right which is protected in all States, although it is not clear what reasons actually prompt the State to protect its citizens in this way—whether it is on militarist, religious, ethical, or rational grounds. Legal sterilisation, as practised in some of the United States and in Denmark, especially on criminals and the insane, has not been in operation long enough to give reliable answers. Prof. Reuter denied the legality of the social or economic indication for sterilisation of an otherwise healthy male or female; he pointed out that only recently a surgeon was heavily fined for performing such operations wholesale in Graz,[1] and that in an action brought against a gynæcological clinic in Vienna for removal of the ovaries of a woman without her knowledge, the surgeons were found guilty. Only the sterilisation of mentally defective persons of both sexes is regarded as an undoubtedly legitimate social indication. But even here a committee of qualified persons should be previously asked to give a written report and unanimous recommendation. The law of 1927 requires also the consent of the other party of a married couple in case of a sterilising operation, and stipulates the possibility of divorce if one party was sterilised before marriage and did not disclose this fact before the union. Prof. Reuter appeals to the medical profession to stick to the medico-biological standpoint, and save as much as possible of the most important function of the human race. We should not be led away, he thinks, by economic and social indications, which are often only transient.

[1] See THE LANCET, 1929, ii., 1281.

DISEASE, DEATHS, AND BIRTHS IN AUSTRIA.

The September report of the Austrian Board of Health gives an extensive survey of the health of the people during 1929. The population of the Republic was 6,536,892, and of Vienna 1,886,147; in other words, 30 per cent. are massed in a single city. The number of deaths in Vienna was 26,682, as compared with 25,811 in 1928, while in the whole Republic it rose from 96,321 to 97,377. Of these, 2702 (611) were due to accidents, 2434 (1044) to suicide, and 199 (75) to murder. (The figures in parentheses are those for Vienna itself.) The commonest cause of death was circulatory disease, which claimed 16,606 (6025) victims, as against 15,780 (5628) in 1928. Second in frequency ranks malignant disease, which rose to 10,587 (3639) from 10,239 (3607) in the previous year, while tuberculosis comes third with 10,046 (3364). The figures reveal a constant decline of tubercle and a notable increase of heart disease and new growths. Of the infectious diseases, diphtheria with 624 (217) deaths shows a considerable increase over 1928. Puerperal fever accounted for 263 (126) deaths, while typhoid caused 161 (45), scarlet fever 122 (75), measles 195 (39), and whooping-cough 157 (14), as against 455 (97) in the previous year. No case of small-pox, typhus, or asiatic cholera was notified during 1928 or 1929.

The number of stillbirths was 3109 (525); infantile deaths numbered 5712 (739) in the first month of life, and 12,494 (1449) before the end of the first year, as compared with 13,964 (1750) in 1928. But births have simultaneously fallen from 119,979 (20,158) to 113,280 (17,144).

In the agricultural districts the deaths of infants and children up to 5 years comprise over half of all deaths, whilst in the industrial parts and in Vienna these deaths form only about 15-25 per cent. (in Vienna alone only 14 per cent.) of the total. Another interesting feature in this year's report is the item: "Born under the aid of qualified midwives or medical men." In Vienna for many years every child has fallen under this heading, and in the whole Republic only about 4 per cent. of births have taken place without such assistance.

LADIES' MEDICAL GOLFING SOCIETY.—At the autumn meeting held at the Ashford Manor Golf Club on Sept. 23rd the Cecil Leitch Prize for a medal round on handicap was won after a tie by Mrs. Roberts Harris (80), who also won the first division handicap prize, Miss Roberts Harris being second. The scratch prize was won by Mrs. Cavendish Fuller (87) and the captain's prize by Mrs. Massey (156 for two rounds). Mrs. Oldershaw (80) won the second division prize and Miss M. Hamilton (84) and Mrs. Hobson (90) the third division prizes. In foursomes Mrs. Marriage and Mrs. Dudgeon were first and Mrs. Roberts Harris and Mrs. Fletcher second.

OBITUARY

SIR NEVILLE HOWSE, V.C., F.R.C.S. Eng.

The death of Sir Neville Howse in London on Sept. 21st ends a distinguished career in medicine, the army, and in the political life of Australia.

Neville Reginald Howse was born 67 years ago, the son of Dr. Alfred Howse, of Stogursey, near Bridgwater in Somerset, and was educated at Fulland's School, Taunton. Entering the London Hospital he qualified as M.R.C.S. in 1887, and went out to Australia. In 1896 he came back to the hospital as house surgeon, and in 1897 was admitted to the Fellowship of the Royal College of Surgeons. Returning once more to Australia, he practised for a couple of years in New South Wales, but his work was soon interrupted by the South African war. Volunteering in October, 1899, he later held a captain's commission in the New South Wales Medical Staff Corps, and saw much service in the Orange River Colony and the Transvaal. He was awarded the Victoria Cross for gallantry during the action at Vredefort on July 24th, 1900, when he carried a wounded man to safety in face of heavy cross-fire.

After the Boer war Howse practised at Orange, in New South Wales, and with success. In 1914, however, he was again called upon for military service, and was appointed principal medical officer to the Australian Naval and Military Expedition to New Guinea and the Pacific Islands. When this expedition returned he went to the Dardanelles as A.D.M.S. to the 1st Australian Division, and was in charge of the medical arrangements at Anzac. For his work at Gallipoli he was mentioned in despatches and created C.B. When the Peninsula had been evacuated he came to England as Director of Medical Services, Australian Imperial Force, and in 1917 was promoted K.C.B. His work in France was of conspicuous value, and after the war he was further honoured by being made K.C.M.G. In 1921 he was appointed Director-General of Australian Army Medical Services, but he retired in the following year with the rank of major-general. His public service, however, was by no means at an end, for he was at once elected to the Commonwealth House of Representatives, and later held office as Minister for Home and Territories, as Minister of Defence, and as Minister of Health. He was one of the Australian representatives at the Fourth Assembly of the League of Nations in 1923, and it was at one time thought that he might succeed Sir Joseph Cook as High Commissioner in London. He remained in close touch with some of his old friends at the London Hospital, and attended the annual dinner a couple of years ago.

Sir Neville Howse married in 1905 Evelyn Northcote, eldest daughter of G. de Vial Pilcher, of Newstead, Orange. They had two sons and three daughters.

ROBERT WILLIAM MACKENNA, M.D. Edin.

WE have to record that Dr. R. W. MacKenna, dermatologist to the Liverpool Royal Infirmary, died on Sunday last at the age of 56. He was widely known not only in his specialty but as a novelist, and his death will be deeply regretted.

The son of the Rev. R. MacKenna, minister emeritus of the Martyr's Church, he was educated at the Dumfries Academy and the Edinburgh High School and graduated both in arts and medicine at the Edinburgh University, proceeding to the M.B. degree in 1898. Later he did post-graduate work on the Continent. His practice at Liverpool was at first a general one, but within a few years he began to devote himself exclusively to dermatology and he was soon elected assistant physician to the Liverpool Skin Hospital. He became one of the leading specialists in Lancashire, and in 1919 was appointed to the staff of the Royal Infirmary and lecturer in the University. He was also consulting dermatologist to the Cancer and Skin Hospital and a keen supporter and valued member of the Liverpool Medical Institution. For some years he was the general secretary and he was largely responsible for the resuscitation and success of the *Liverpool Medico-Chirurgical Journal* of which he was an exceptionally active editor.

An intense and enthusiastic worker and an excellent teacher Dr. MacKenna embodied much of his experience in the well-known text-book of dermatology which bears his name. Further, he was a witty and ready speaker, and a welcome guest at many civic functions.

"It is difficult," writes Prof. R. E. Kelly, "to appreciate the loss Liverpool has sustained in MacKenna's death. Quite apart from his professional reputation, which was deservedly high, he had a genius for friendship which endeared him to everyone to whom he spoke. I know of no one who was so universally loved. It is difficult to exaggerate the amount of work he did, not only for his patients, but also for a generation of medical students whose training seemed to be one of the pleasures of his life. He spent laborious days in making and painting a collection of wax models illustrative of his work, and he wrote a text-book which for clarity, wisdom, and artistry remains unsurpassed by any English text-book. But perhaps it was not as a doctor that MacKenna would wish to be remembered. He had an absorbing interest in literature and this, with his own mastery of words, led him during the war to 'scribble' as he used to put it. The change from a consulting practice in Rodney-street to a hospital in France first impelled him to take up his pen, and in the 'Adventure of Death' he scored his first success. This was followed later by the 'Adventure of Life.' These were studies rather than stories, some, poignant in their intensity, suggested by what he himself had seen during the war. Then came the novels 'Flower o'the Heather,' 'Through Flood and Fire,' both tales of the Border, of the Covenanters and their persecutors. And then 'Bracken and Thistledown' and 'O Rowan Tree,' tales of Scottish village character filled with that Scots humour which always seems to need a little dialect to tincture it. In this milieu he fitted perfectly. The spirit of the Border was bred in his bones. MacKenna often said that 'Through a Tent-door' was his best book. It certainly reflects his philosophy, for to him throughout life charity stood first."

Dr. MacKenna's war service was with the 57th General Hospital B.E.F., where he acted as physician and dermatologist. He married Dr. Harriet Amelia Scott Bird, daughter of the Rev. Charles Bird, rector of Castle Eden, and leaves one son, Dr. R. M. B. MacKenna, who is also a dermatologist.

UNIVERSITY OF DURHAM.—At the opening of the winter session of the College of Medicine on Thursday, Oct. 9th, an address on the Genesis of the Physician's Ideal will be given, at 4.15 P.M., by the Bishop of Durham, Visitor of the University.

MEDICAL NEWS

University of Birmingham.

Medals and prizes will be presented to students of the Faculty of Medicine on Monday, Oct. 6th, at 5 P.M., in the Medical Lecture Theatre, Edmund-street. An address to students will be given by Prof. Priestley Smith, F.R.C.S.

Lectures on Industrial Psychology.

The London School of Hygiene and Tropical Medicine announce the following special lectures by Dr. Millais Culpin, Consultant to the Industrial Health Research Board:—Sept. 29th: Importance of Psychological Aspects of Illness. Oct. 1st: Psychology—the History of Medical Views; 6th: Psychology—Nomenclature and Classification; 8th: Psychology—the Incidence of Symptoms, the Occupational Neuroses; 13th: Psychology—Theories of Psychopathology; 15th: Psychology—Theories Concluded. The lectures are open free of charge to members of the public health service and others interested in public health work. They will be given at 3 P.M.

Post-graduate Work in Manchester.

The post-graduate programme for Manchester for the year 1930–31 has been arranged in part by the Faculty of Medicine of the University and in part by the staffs of the hospitals working in coöperation. Courses are to be given in ophthalmology (October), dermatology (February), operative surgery (October), bacteriology (October). It is hoped that the highly successful course in obstetrics given by the staff of the St. Mary's Hospitals will be repeated in June. Clinical assistantships are available in special subjects, including radium therapy. Ancoats Hospital affords clinical teaching every Thursday morning, open to all practitioners who care to come. In the afternoons the Royal Infirmary will hold its usual lectures by members of the staff and others on Tuesdays and Fridays, and Ancoats Hospital on Thursdays.

The Lloyd Roberts Lecture for the year will be given by the Bishop of Birmingham on Friday, Nov. 7th, in the Physiological Theatre of the University. His subject will be Heredity and Predestination.

Proposed Medical Socialist Organisation.

A meeting was held at the National Labour Club on Sept. 21st to discuss the formation of a medical socialist organisation. Dr. M. I. Finucane, J.P., was called to the chair, and Dr. C. W. Brook (London), convener, read letters of apology for absence from Dr. Drummond Shiels, M.P., Under Secretary for the Colonies, Mr. Somerville Hastings, M.P., and Dr. Stella Churchill, L.C.C. Dr. Brook said he had received a letter from Dr. Ewald Fabian, of Berlin, informing him that an International Union of Socialist Physicians was about to be created; strong national medical socialist bodies were in existence, and regret was felt that in England there was no similar organisation. The creation of a British organisation was, Dr. Brook continued, justified on several grounds: (1) as a means of pressing for the establishment of a properly organised national health service, (2) as a means of contact through the International Union with other national organisations, (3) as a means of devising legislation for the benefit of the health of the workers and of bringing pressure on the authorities to carry such legislation into effect, (4) as a means of propagating socialism among the medical profession—he would admit students as associates and thus carry the campaign into the medical schools, (5) as a means of working as an organised body of socialists within existing medico-political organisations, and (6) as a means whereby medical men and women who for economic reasons cannot join a local Labour Party or I.L.P. branch, can become affiliated members of the Party. In the discussion which followed, Dr. F. G. Bushnell (Plymouth) suggested that such an organisation would assist the workers' health committees now in process of formation by the I.L.P. Dr. Menon promised the organisation the support of Indian medical practitioners in this country, Dr. P. Macdonald (York) said that while he was in favour of the extension and improvement of the existing voluntary hospital system, he would support the establishment of such an organisation. Miss Esther Rickards, M.S., L.C.C., thought it would prove useful to Labour members of committees of municipal hospitals, and to the medical advisory committee of the Labour party. A resolution in the following terms: "That the members of the medical profession whose political views are in agreement with those of the Labour party and with the ideals of socialism be organised as a political body and that a committee be formed to draw up a constitution for this body and that this draft be submitted to a meeting of all those medical men and women known to hold political views in accordance with those of the Labour party and with the ideals of Socialism" was proposed and carried unanimously.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Sept. 29th, to SATURDAY, Oct. 4th.—METROPOLITAN HOSPITAL, Kingsland-road, E. Special Post-graduate Course in Medicine, Surgery, and the Special Departments, occupying from 10.30 A.M. to 5.30 P.M. Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Sept. 29th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY, Oct. 1st.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Sept. 29th.—10 A.M. to 1 P.M., Surgical Ward-, Genito-Urinary Operations, Skin Department. 2 P.M., Operations, Surgical Wards, Medical, Surgical, Eye and Gynæcological Out-patients.
TUESDAY.—10 A.M. to 1 P.M., Medical Wards, Clinical Demonstration (Surgical Dental Department). 2 P.M., Operations, Medical, Surgical, and Throat Out-patients.
WEDNESDAY, Oct. 1st.—10 A.M. to 1 P.M., Medical and Surgical Wards, Children's Medical Out-patients. 2 P.M., Gynæcological and General Operations, Medical, Surgical, and Eye Out-patients.
THURSDAY.—10 A.M. to 1 P.M., Neurological Out-patients, Demonstration of Fractures. 2 P.M., Operations, Medical, Surgical, and Genito-Urinary Out-patients.
FRIDAY.—10 A.M. to 1 P.M., Medical Wards, Skin Department, Dental Department, Clinical Demonstration (Medical). 2 P.M., Operations, Medical, Surgical and Throat Out-patients.
SATURDAY.—10 A.M. to 1 P.M., Throat Operations, Bacterial Therapy Department, Medical Wards, Children's Medical and Surgical Out-patients.

ST. MARY'S HOSPITAL POST-GRADUATE COURSE.
FRIDAY, Oct. 3rd, to SUNDAY, Oct. 5th.—Lectures and demonstrations beginning at 10.15 A.M. daily, and continuing till 4 P.M. on Friday and Saturday, and 12.45 P.M. on Sunday.

CHARING CROSS HOSPITAL POST-GRADUATE COURSE.
SATURDAY, Oct. 4th, and SUNDAY, Oct. 5th.—Lectures and demonstrations from 9.30 A.M. till 4.15 P.M. on Saturday, and from 10 A.M. till 4.45 P.M. on Sunday.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Oct. 3rd.—4 P.M.: Mr. Gill-Carey: Foreign Bodies in the Food and Air Passages.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Oct. 1st.—4.30 P.M., Dr. Nathan Mutch: Urinary Antiseptics.

Births, Marriages, and Deaths

BIRTHS.

GILLBARD.—On Sept. 14th, at Sherfield, Hants, the wife of Dr. Windham Gillbard, of a daughter.
LEWIS.—On Sept. 18th, at West End-lane, N.W., the wife of Dr. H. E. Lewis, of a son.

MARRIAGES.

ABERCROMBY—GLOVER.—On Sept. 17th, 1930, Roy William, son of Mr. and Mrs. William Abercromby, of Grassendale, Liverpool, to Barbara M. L. Glover, M.B., B.S. Lond., only daughter of Dr. and Mrs. Lewis G. Glover, of Hampstead, London.
LODGE—LANKESTER.—On Sept. 20th, at Clarendon Park Congregational Church, Leicester, Ralph Lodge, M.B., F.R.C.S. Edin., to Kathleen Mary Lankester, M.D., B.S. Lond.
SCARFF—SOMERVILLE.—On Sept. 16th, at St. Saviour's Church, W., Gordon Russell Scarff, F.R.C.S.E., to Janet Layton, younger daughter of the late F. G. Somerville, Singapore, and Mrs. Somerville, Maida Vale, W.

DEATHS.

HOWSE.—On Sept. 19th, at a London nursing home, after an operation, Major-General Sir Neville Howse, V.C., K.C.B., K.C.M.G., F.R.C.S., aged 67.
MACKENNA.—On Sept. 21st, 1930, at 76, Rodney-street, Liverpool, Dr. Robert William MacKenna, dearly loved husband of Harriet MacKenna. Interred at Allerton Cemetery, Liverpool, after service at the Cathedral.
MINNS.—On Sept. 16th, at Dorking, Allan Glaisyer Minns, M.R.C.S., L.R.C.P., late of Thetford, Norfolk, in his 72nd year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

MODERN VIEWS ON RHEUMATISM IN CHILDHOOD.*

BY E. C. WARNER, M.D., M.R.C.P. LOND.,
PHYSICIAN TO THE CHILDREN'S DEPARTMENT, MILLER GENERAL HOSPITAL, GREENWICH; MEDICAL REGISTRAR, GUY'S HOSPITAL.

THE prevalence of rheumatism in childhood is brought home to us when we realise that of the 5,000,000 children in attendance at the elementary schools, about 250,000 suffer from this disease. Of these, at least 40,000 are known to have rheumatic heart disease, and about 25,000 persons die each year from its ravages, the majority in early youth. These are lives that we can ill-afford to spare; and even then we have not mentioned the large numbers of young people who spend years of chronic invalidism preceding the early death of the majority.

Ætiology.

It is not surprising therefore that a considerable amount of attention has been given to the factors underlying this disease during the last few years; there have been special reports of the results of the labours of committees set up in this country by the Ministry of Health, the Medical Research Council, and the British Medical Association; and from New York there have been the reports of the New York Tuberculosis and Health Association. From these, and from the work of many different physicians, among whom the most prominent have been F. J. Poynton, C. F. Coombs, R. H. Miller, G. F. Still, and L. Findlay, we are beginning to get an accurate insight into some of the causes underlying rheumatic disease in children. It is essentially a disease of a temperate climate. Thus in the northern hemisphere it is common in Great Britain, Scandinavia, Germany, France, Canada, and the U.S.A.; in the southern hemisphere it is common in South Africa and Australia. In the extreme north it is much less frequent, and it is found that the Eskimos are rarely affected; also as we near the tropics the incidence falls. D. Seegal showed that in the Southern States of America the incidence is only one-eighth to one-tenth of that found in the Northern States. The occurrence of the disease is much commoner in the winter and early spring months than it is in the summer months. It is especially prevalent in November, December, January, and February, and twice the number of attacks start in these months as compared with May, June, July, and August. In agricultural districts a smaller percentage of children is affected than in large towns.

DAMP.

Another climatic cause that has been investigated is dampness. Generally speaking, it is agreed that excessive dampness does predispose to rheumatism. A large number of rheumatic children live in the neighbourhood of rivers and water-courses, and so, for instance, the Wandle valley deserves censure in this respect. But this factor cannot be of extreme importance. The incidence was very low in the troops in Flanders during the war, although here terribly wet conditions prevailed for long periods. And surely if it had much effect the country labourer's child, who may have to walk long distances to school in very inclement weather, should be more, and not less, liable than his city cousin? In fact, it has often been noticed that years with a low rainfall cause more cases than very wet years; it seems as if the infecting agent is able to propagate more freely in the rainless years, and so cause more havoc amongst the child population.

HEREDITY.

Among the more immediate causes, most observers agree that where there is a family history of juvenile rheumatism many more cases occur. Thus is a recent investigation it was found that there was a family history of rheumatism in 58 per cent. of rheumatic children attending here or at Guy's Hospital, compared with 23·5 per cent. in non-rheumatic children. Dr. J. A. Glover in his recent Milroy lectures interpreted this as evidence in favour of direct infection from one member of a family to another. He has done great service in drawing attention to this possibility, and showed how any severe form of overcrowding in young adults, as in barracks, causes an outbreak of the disease. But in spite of this factor of infectivity, probably there is an inherited tendency as well, for we find that there was a much greater incidence of juvenile rheumatism among the grandparents of rheumatic children than among those of non-rheumatic children.

POVERTY.

No one disputes the fact that rheumatism is essentially a disease of the poor. As contrasted with the figures from the out-patients' department of this hospital, where every seventh child between the ages of 3 and 12 attends for rheumatic disease in one form or other, cases are rarely seen in the private practice of children's physicians. Thus Still says that amongst his private patients only 1 child in every 140 is brought to him on account of rheumatic disease. At Eton College the medical officer, Dr. W. H. Attlee, stated in a recent letter that he has only had one case of rheumatic disease amongst the boys during the past 19 years, and yet the elementary school-children of Eton show just as many cases as elsewhere in the country. We may well ask ourselves, What are the factors so closely associated with poverty which make rheumatism so very prevalent in the lower and so rare in the upper classes? Evidently climate cannot be the determining cause, and as we have already seen, it is not of much direct consequence. We can consider this subject on the same lines that many other diseases have been tackled in the past. For the disease to flourish, there must be a susceptible population, "the soil," and frequently in addition an infecting agent, "the seed." Without a suitable soil no seed can flourish. It seems that if we are to get to the bottom of this disease we should concentrate on the factors associated with poverty first, and then find out, if possible, what is the nature of the infecting agent. It is a striking fact that if we take poor children away from their environment and put them into relatively good social conditions they do not tend to develop rheumatism. This in itself shows that heredity is not of great importance. We find that children in the guardians' homes rarely develop rheumatic disease de novo. Thus in four such homes studied in the M.R.C. report, an incidence of only 1 per cent. was found, as contrasted with a general incidence in poor children of 5 to 6 per cent. And even then quite a number of the rheumatic children in these homes had had the disease before admission, and had a relapse after admission. This low infectivity-rate cannot be due to the absence of the virus, for this must have been present in the children who had had attacks before admission and who relapsed subsequently. The general supervision of these children must be of value, for usually they are under the supervision of trained foster-mothers, in well-built and well-ventilated cottage homes. But a factor that has not received the attention that it deserves seems to be the question of diet. No child can have an adequate resistance to disease if he is not properly fed. Probably the plain but good fare provided in these institutions is of immense value in raising the resistance of the children.

* An address delivered at the Miller Hospital before the West Kent Medico-Chirurgical Society.

VITAMIN DEFICIENCY.

In the first two years of life everyone recognises that the most prevalent poverty disease associated with poor feeding is rickets. We now know that this is due to absence of the vitamins found in animal fats. Lack of the fat-soluble vitamin D factor causes the bony changes of rickets itself, and the lack of the associated fat-soluble A factor causes lack of resistance to infection. This has been clearly shown by Prof. E. Mellanby both in human beings and in well-controlled experiments on animals. This lack of the vitamins D and A explains the common association of rickets with infective disorders of all kinds, such as bronchitis, broncho-pneumonia, diarrhœa, and vomiting.

At the age of 2 or thereabouts rickets practically ceases to show itself owing to the slower rate of growth of the child. But we should not expect a dietetic deficiency of this sort to cease to have *any* ill-effect. It is from the age of 2 upwards that rheumatic disease becomes a serious problem in poor children. Yet there is no disease which is recognised to take the place of rickets at the age of 2 years. I do not think it has been realised that rheumatic disease may well be a successor to rickets. You may well ask if there is any evidence for this; I think there certainly is. In the first place, anyone who has studied the diet of poor children realises that they receive very little in the way of animal fats. Milk, eggs, butter, meat, and cheese are all much too expensive for the poor mother to provide. She has to find cheap and bulky food to satisfy the appetite of the growing child, and so she concentrates on bread and other starchy foods (which are in themselves believed to be contributory to the development of rickets in infancy). On inquiry, one frequently finds that one or two pennyworth of milk a day has to serve a large family of poor people, adults and children; and margarine always has to serve for butter in the diet. I think it is evident that the animal fats are largely missing from the diet of poor children long after the age of 2. A second point is that this parallel between rheumatic disease and rickets at the different ages may help to explain why both are so very much more prevalent in the winter and early spring months. A point to which I would like to draw your attention is recent work on calcium metabolism in the poor. In the absence of adequate vitamin D, calcium is deficient in the body, as in rickets. When we study the calcium metabolism of rheumatic children, we find that the blood and cerebro-spinal fluid (and probably therefore other body fluids as well) are deficient in calcium.

Howland and Kramer found higher values in children than in adults, and this would still further accentuate the low values met with in children suffering from rheumatism and chorea. The reason that I mention the values in the C.S.F. is, that in the first place the values here represent the value of the active ionic calcium of the blood, and also, of course, the C.S.F. is the medium bathing the nerve cells. Corresponding to this low value in C.S.F. calcium, we find an increased electrical excitability of the nerve cells and fibres which I am sure is contributory to the choreic state, just as it is to tetany in infants. I hope I may have convinced you that it is well worth studying the diet of rheumatic children, as the absence of the fat-soluble vitamins may well help to explain the state of debility of the rheumatic child which may precede the signs of infection by many months or even years. This is a problem that no one has yet tackled seriously, and which we are just starting to investigate in this district with the help of the Medical Research Council.

THE INFECTING AGENT.

Reverting to our old analogy, do we know anything about "the seed"? Most observers agree that during the acute stages of rheumatism and chorea there is an infection. This must be the explanation of the little nodules scattered throughout the body, and so evident at post-mortem as the vegetations in the cardiac valves. But no one is as yet certain of the nature of the infecting agent. The most popular theory is that of Poynton and Paine that we are dealing with an infection with a diplococcus, the *Diplococcus rheumaticus*. I will not weary you with the evidence for and against this but it is by no means certain that this *is* the infecting agent. So far the *Diplococcus rheumaticus* has not fulfilled even one of Koch's four postulates.

Whatever the infecting organism may be, if we could find the paths of entrance into the body, can we block these, and in this way prevent infection? For a long time it has been assumed that the path of entrance is largely through the tonsils. It has often been pointed out that an attack of tonsillitis immediately precedes an attack of rheumatism in about 10 per cent. of cases, and this has led in many cases to the routine removal of tonsils in the hope of preventing this. It is well that we should carefully analyse the evidence, for should this be so, we have a wonderful prophylactic measure at our command. In the first place, we can only accept the statistics on children. Thus we cannot accept the often-quoted figures of Starling, of Mackie, or Lambert, as applying to children, as most of their cases were adults.

SORE-THROAT AND TONSILLITIS.

It is quite true that rheumatic children very commonly have a history of one or more sore-throats. Thus recent figures show that 48 to 58 per cent. of rheumatic children give this history. But in a control group of non-rheumatic children it was found that 58 per cent. of them also give a history of tonsillitis; in a very careful research carried out in New York it was found by Wilson, Lingg, and Croxford that there is a history of sore-throats in just as many children after their tonsils have been removed as when they have not been operated on!

Apart from this, are the tonsils of rheumatic children more "septic" than those of non-rheumatic children? The definition of a "septic tonsil" varies widely with different observers; certainly a tonsil is not necessarily septic because it is large—yet this is the apparent assumption made in the report of the Medical Research Council. Frequently a hypertrophied organ is a method of response to increased work, as when after nephrectomy the solitary kidney enlarges to take on the work previously performed by both of them. A definition of a "septic tonsil" should include a consideration of the degree of redness, superficial scarring, the presence of large red granulations projecting from the surface, the redness of the anterior pillars of the fauces, and the amount of debris in the crypts. Adopting all these criteria, a recent series of figures showed very septic tonsils in 6 per cent. of rheumatic children and 5 per cent. of non-rheumatic children; and septic tonsils in 45 per cent. of rheumatic children as compared with 48 per cent. of non-rheumatic children. So there is again no significant difference in the two groups. Similarly, a study of the size of the tonsillar group of lymph glands at the angles of the jaw showed equal enlargement in the rheumatic and non-rheumatic groups.

We can say, therefore, that although there is a large proportion of septic tonsils among rheumatic children, it is not higher than among non-rheumatic children of the same social standing.

Diagnosis.

There is rarely any doubt about the diagnosis of a case of acute rheumatism in a child, with its swollen, hot, tender joints and its general constitutional disturbances. Much more difficulty arises in cases of subacute rheumatism.

PAINS.

We usually class as cases of subacute rheumatism those children with flitting pains which may go from joint to joint, and yet never give rise to effusion, and also those cases in which the pains perhaps never

ctually occur *in* the joints, but are prevalent in the nuscles and tendons around the joints, and are opularly known as growing-pains. A state of lebility may exist for some months or years before he actual onset of rheumatism, and may predispose o it by lowering the vitality of the child. It may e a difficult matter to distinguish the various little ches and pains due to this debilitated condition rom the pains of true rheumatism. We cannot lways rely on the presence of heart murmurs to elp us in this matter. In these debilitated children xtracardiac, or so-called functional heart murmurs, re frequent, and may have to be distinguished from he murmurs of organic heart disease. I am sure it s wrong to regard all growing-pains as being rheuatic; and there are a few points which help us to istinguish those of true subacute rheumatism from hose of simple debility. First, the time of occurence of the pains is of importance. True rheumatic ains occur at any time of the day or night, and are specially noticeable at night, for the parents will ften complain that the child will "lie awake and ry with them." The debility pains are especially net with after exercise, and so a child may "stop nd want to be carried," but when he is taken off is feet the pains go. Secondly, usually the pains of ue rheumatism are severe, and may make the child ry; whereas the pains of debility are rarely more nan an "aching" or "tired" feeling. The third oint is that if we get the history carefully we almost lways find that true rheumatic pains involve the rms as well as the legs, whereas the pains of debility re usually confined to the legs. If we are still in oubt, we may be helped by the results of treatment. f the pains are simply due to debility, they will, as mphasised by Cameron and Osman, subside or be onsiderably ameliorated by giving large doses of lucose, whereas when they are of rheumatic origin his is not sufficient, although, of course, they will ield to salicylates.

CHOREA.

A fully developed case of chorea is easily diagnosed, ut sometimes an early or a mild case may be very ifficult to differentiate from the habit-spasms of a ervous or overwrought child. This is made more ifficult by the fact that children with chorea are apable of inhibiting the characteristic movements f this condition when they are brought for medical xamination. Here the history may be of considerble value; a child who is truly choreic has a history f "tripping over" or "falling about" to an abnormal xtent, and still more important, the finer movements f coördination are lost in simple movements, such s drinking from a cup; a child who suddenly starts o spill his tea at each meal is usually suffering from horea. It is equally important to observe these hildren performing natural movements when they o not think they are being observed; thus it is of reat value to see these children dress and undress hemselves for medical examination, for at such times he movements become much more evident.

CARDIAC SYMPTOMS.

The real importance of rheumatism and chorea om the point of view of prognosis and treatment as to whether the heart is affected. It is well that e should remember that if there is evidence of ffection of the pericardium, or the myocardium, or he endocardium, it is certain that all three parts are ffected to some extent; in other words, we are ealing with a pancarditis. When the pericardium chiefly affected, we get the signs and symptoms of dry pericarditis or of effusion, but on the whole his is becoming a relatively rare event compared to s frequency 30 and 40 years ago. Much more ommonly the myocardium is affected. The muscle iffers from both parenchymatous and interstitial hanges; there is, on the one hand, acute parenchyatous degeneration of the muscle, and, on the other, flammation of the interstitial tissue with the production of typical Aschoff's nodes. In this case we find on examination that the apex-beat is displaced outside the nipple line; and on percussion of the left border of the heart it is found to be outside its normal position. Associated with this dilatation there may be two types of murmur. The commonest is a short, soft apical systolic murmur, frequently localised to the actual apex, or just inside it; the other type is a reduplicated second sound at the apex, which may even develop into a short soft mid-diastolic murmur. As C. G. Kemp has recently shown, both these may disappear completely, and it is probable that both of them are of myocardial rather than of endocardial origin.

As contrasted with these soft murmurs, murmurs due to disease of the mitral valve, especially when they become advanced, usually give rise to harsh conducted murmurs, which may be heard well out in the axilla or over the sternum itself. These much more rarely disappear, but it is amazing that some which one would have thought could not be anything else than permanent, may gradually become less marked and even disappear completely with adequate treatment.

SUBCUTANEOUS NODULES.

The presence of large rheumatic nodules over the subcutaneous areas is happily rare nowadays, for they are almost invariably associated with very severe carditis. Any case that presents these nodules has large numbers of them actually in the wall of the heart itself, and this means severe myocardial and endocardial damage. Thus in a series of 33 cases which Poynton collected, 12 were fatal, 15 had severe heart damage, 4 had slight cardiac involvement, and only 2 were free from carditis.

Another nodule, on which Vincent Coates and Carey Coombs have laid stress, is the so-called subminiary nodule. These are said to be "pocket editions" of the more familiar large nodules, and to have the same significance. They are said to occur in rheumatic children often many months before there is any other sign of rheumatism, and to be present in 78 per cent. of rheumatic children, and never in non-rheumatic children. They are especially prominent in the flexor tendon sheaths, along the ulnar borders of the forearm, and over the vertebral spines, as little millet seed granules. They should therefore be of extreme value in the early diagnosis of rheumatic disease; but unfortunately they are not as conclusive as we are led to believe. After many months of practice, Dr. N. Gray-Hill and I recently went round the children's wards at Queen Mary's Hospital at Carshalton. We could certainly feel these granules in a large number of the children with tuberculous bone disease, although they were usually present in greater numbers in the rheumatic children. So we cannot rely on them as furnishing definite evidence of rheumatic trouble in children.

Treatment.

To be really successful with rheumatic disease we must get our cases in as early a stage as possible. As time goes on the general public is getting more and more educated in simple matters of general health, and thus parents are realising that many of the little "growing pains" of childhood may be of immense importance in pointing to the possibility of rheumatism, and so of an affection of the heart.

PRE-RHEUMATIC STATE.

Prevention is always better than cure, and it is well that we should be able to recognise the pre-rheumatic state of debility which so lowers the resistance of the child that he falls a ready victim to an acute attack of rheumatism or of chorea a few months later. I am sure that Prof. C. W. Vining is right when he remarks that if we take frankly rheumatic children and inquire into their past history, we usually find that for some months preceding the acute outbreak they have not been fit children. Common symptoms in these early months are pallor, undue fatigue on exertion, persistent headache not

associated with eyestrain, unexplained sweating, loss of weight, and signs of mental exhaustion such as night terrors, acquired enuresis, stammering, habit-spasms, irritability, and the exhibition of bouts of temper.

If we see the children in this stage, and particularly if there is a family history of juvenile rheumatism, we may prevent much trouble later on by getting the children really fit. This is where, in poor districts such as this, the Invalid Children's Aid Association is doing such valuable work, for this association will send such a child for convalescent treatment in more congenial surroundings for four or six weeks, and so may prevent lifelong mischief. Once such a child comes to look fit and well, with rosy cheeks, plenty of energy without getting overtired, and is putting on weight rapidly, there is very little danger of the supervention of rheumatism.

THE ACTIVE STAGE.

Unfortunately we do not always see the children at this stage, and may only be called to see them when they are already in the clutches of the infection. Then the general measures to be adopted are very much those we adopt in cases of tuberculosis—rest and quiet, plenty of good food, sunlight and fresh air in the acute stages, and the re-education of the heart when the active stage has passed. The problem we are faced with is how best to accomplish this. Undoubtedly the ideal thing is to send the child into a special institution in the country. The London County Council has such an institution at Carshalton, to which some 400 extra beds for rheumatic children are being added this year. The end-results of the treatment at Carshalton amply justify the expenditure involved. Although the cases sent to Carshalton were initially more severe cases than those treated at home, yet the relapses in the first three years are only half the number met with in cases which have not had prolonged institutional treatment. But the accommodation is such that over 70 per cent. of cases have to be treated in their own homes, under the care of the general practitioner. The ideal is to insist on absolute rest during the acute stages, although we all know how very difficult this is. In the one- or two-roomed homes, with the mother at work all day, and other children playing in the same room as the sick child, it becomes almost impossible. But assuming that our conditions are reasonably good, when are we to allow the rheumatic children to start a little extra activity; when, for example, should an extra pillow be allowed, and how soon may the child start to feed himself? Findlay has pointed out that if the heart is not involved in the first two attacks, it never is in subsequent attacks; so if we have seen the child through two attacks without carditis, we need not be so rigid in our measures in the third and subsequent attacks.

CARDIAC INVOLVEMENT.

When the heart has been involved the very minimum of complete rest is four weeks after active disease has subsided. How are we to know that the heart disease is quiescent? There are certain points that do help us in this matter. First, the temperature should be rigidly normal. A temperature which at night often goes up to 99·5° F. or over in a child who is lying absolutely quiet in bed is suspicious of active infection. Again, a constantly rapid pulse-rate usually means that the attack has not subsided. It is true that sometimes for months after all other signs of activity have disappeared the pulse remains rapid; in these cases it appears as if the normal vagal control of the heart has been lessened by the disease, and when the child is allowed up the pulse-rate falls, instead of rising; but on the whole these cases are rare. Another sign which I have found of value is the presence of sinus arrhythmia. Most healthy children show a rhythmical rise in pulse-rate with inspiration and a fall during expiration. My experience coincides with that of Dr. Martin Raven, that when sinus arrhythmia reappears usually active carditis has subsided. The other point I would like to stress is the character of the heart sounds and murmurs. During active carditis there is an accentuation of the first sound at the apex and of the pulmonary second sound at the base, which disappears when the disease subsides. Changing murmurs, particularly at the apex, mean that the heart is altering for better or for worse. First the short soft mid-diastolic murmur should disappear, then the apical systolic murmur becomes softer still and less marked, and finally *it* disappears. When the cardiac sounds have reached a constant state and the heart is keeping the same size as judged by the position of the apex-beat and of the left border of the heart, then usually the disease is quiescent; but these can only be appreciated by repeated examination.

SPECIFIC TREATMENT.

Nothing has superseded the administration of sodium salicylate for acute and subacute rheumatism. When large doses of sodium salicylate, combined with equal quantities of sodium bicarbonate are given regularly to a rheumatic child, the pyrexia and the pain and swelling have almost entirely gone in two or three days. Recently we have been trying the effects of sodium salicylate by intramuscular injection, and the results do show that this is of advantage in getting an even more rapid response. Usually the temperature is normal in 24 hours, and the pains and swellings have gone. The dose we have been using is gr. 1 for each year of the child's age, dissolved in 1 c.cm. of water, and given once a day for four days only. It is a great misfortune that the salicylates are not of equal value in controlling rheumatic cardiac disease. Everyone agrees that the heart is not benefited at all by salicylate therapy, and in my opinion it has a considerable disadvantage in that, once the acute pains have gone, the antipyretic effect may mask a little constant pyrexia which would show us that the disease is still active and so further rest in bed is necessary. In fact, there is no specific drug which controls the cardiac infection; but I certainly have seen cases with persistent tachycardia (which, of course, throws extra strain on the heart) benefited by digitalis.

For chorea, on the whole salicylates do not help to control the violent muscular movements, although some people have recorded benefit with aspirin. Arsenic is not of much value except occasionally in very large doses, and the risk of producing arsenical neuritis is such that I do not think this is justifiable. On the whole, large doses of various hypnotic drugs are undoubtedly beneficial. Thus chloretone and luminal are both good if pushed. But to get any real benefit the patient has to be rendered almost comatose, and so renders necessary constant skilled attention which cannot be obtained except in hospital. Recently Poynton and Schlesinger have reported good results with nirvanol, a hypnotic and sedative drug closely allied in its constitution to luminal. Usually in three or four weeks, if a sufficient dose is given so as to produce a temperature of 99°–104°, drowsiness and a rash, the chorea subsides on withdrawing the drug. This, again, can only be used in hospital, and really dangerous toxic symptoms are occasionally encountered, such as jaundice and nephritis.

In view of the known sedative effects of calcium salts on nervous and muscular tissues, and the considerable deficiency of calcium met with in chorea, I have recently been using intramuscular calcium chloride and parathormone. This latter drug is the active principle of the parathyroid glands, and injection of it raises the active inorganic calcium of the blood and cerebro-spinal fluid. About 90 per cent. of cases are undoubtedly benefited by it, and in the first 20 cases the average duration of the chorea was only four and a half weeks after starting treatment. I have had complete success with cases of chorea which have been going on continuously for 9 and for 24 months. These long-continued cases frequently show severe

ıental changes, and the improvement in the mental ɔndition has been most gratifying. The para-ıormone is given twice daily in doses of ♏ iv for child of 4 years, ♏ v at 7 years, and ♏ vi at) years. In these doses I have never had any toxic ffect, and even if an overdose is given the vomiting ɔ caused subsides immediately if the next dose is mitted. The only disadvantage is the price of the rug. A bottle of 5 c.cm. costs 16s., but the undoubted enefit is such that I think this is well justified in any ıt the very poorest cases.

TONSILLECTOMY.

A therapeutic measure often done as a routine to ısten recovery and to prevent relapses is to remove ıe tonsils. We have already seen that although ɔparently septic tonsils *are* frequent in rheumatic ıildren, they are not more frequent than in non-eumatic children of the same social class. It is ell that we should see whether this routine tonsillec-my *is* of advantage. Practically everyone who has udied this problem, and has had a group of non-nsillectomised children as a control, agrees that utine tonsillectomy is of no value. With regard to currences after tonsillectomy, the results are set t in the following Table :—

Percentage of Recurrences of Rheumatism in Children.

	(1) after tonsillectomy.	(2) not tonsillectomised.
Ingermann and Wilson ..	76	80
Hunt and Osman	53	42

d in the very carefully controlled groups of Wilson, ngg, and Croxford the conclusion reached was that e number of attacks is rather greater in the operated oup than in the non-operated group. Findlay, cfarlane, and Stevenson, working in Glasgow, ached the conclusion that there may be slight nefit in cases of rheumatism in preventing attacks arthritis and heart disease, but the evidence is only ghtly in favour of the tonsillectomised children as mpared with the non-tonsillectomised. Actually in orea, however, the number of attacks is more than ubled by a previous tonsillectomy, and tonsillec-my does not lessen the incidence of carditis. It is ite unknown why tonsillectomy should cause a eumatic child to develop chorea so much more en, but everyone who has worked on this subject s come to the same conclusion. So far, then, nsillectomy after the first attack of chorea or eumatism does not diminish the frequency of further acks or of heart disease, and actually in chorea it contra-indicated. While accepting this, it has been gued that if only tonsillectomy had been performed ore the first attack it might have prevented the set of rheumatism. Recently Dr. J. M. H. Campbell d I went through all our records here and at Guy's spital, and found that this is not true either. king all the children between the ages of 3 and 12 ending the children's out-patient departments, it s found that 15·3 per cent. of children who had l tonsillectomy on an average two years before umatism set in developed the disease, and 15·6 per t. of children who had never had tonsillectomy l likewise. Also the percentage who developed ditis was the same in the two groups.

think we may fairly sum up the problem of sillectomy by saying that it has no influence on initial onset or of recurrences, or of heart disease ; ually in choreic children it is contra-indicated ause it considerably increases the frequency of attacks. This does not mean to indicate that sillectomy is never justifiable in rheumatic ldren. If the tonsils are causing a condition of eral ill-health then they should be removed, in er to improve the general resistance ; but routine sillectomy is on the whole injurious and certainly beneficial. It appears as if the hypertrophied sils of rheumatic children may actually help in ing the resistance of the patient, as has long been ocated by Digby and by Canfield. The amount of hypertrophy of the lymphoid follicles in the naso-pharynx that one sees after tonsillectomy is often remarkable, as if the remnants are doing their best to take on the function of the removed tonsils. I have often been struck with the way the tonsils of children sent to Carshalton shrink in size during the stay there, as if under the better conditions prevail ing there the need for them is decreased. I do feel that if instead of enucleating the tonsils we were to treat tonsillitis in more serious fashion we should be doing much to lessen its sequelæ. Close and Osman have shown that the body metabolism does not return to normal until more than three weeks after an attack of tonsillitis, and during this time sequelæ such as nephritis and rheumatism may occur. If we were to treat tonsillitis with as much caution as we do scarlet fever we should see very much less of its sequelæ.

Conclusion.

This survey of the present position may not sound very cheerful, for with 250,000 rheumatic children to deal with in England and Wales we find we have no specific treatment apart from general hygienic measures. But the position is improving with the better conditions prevailing among the poorer classes. The death-rate per 1,000,000 from rheumatic fever in England and Wales has fallen from 87 in 1890 to 36 in 1927 ; and Sir Thomas Horder has pointed out that the severe cases with pericarditis, hyperpyrexia, and cerebral symptoms are much rarer than they were 30 or 40 years ago. If only we can gain more knowledge of the means of keeping up the resistance of the poor child, I feel sure we shall be well on the way to prevent rheumatism, and the great avenue remaining to be explored is the diet of the rheumatic child. But it is the general practitioner who sees these children in their pre-rheumatic state of debility, or in the early days of the disease itself, and our chief hope for the future must rest on his skill in recognising the true state of affairs, of dealing with them as promptly as possible, of referring severe or difficult cases for institutional treatment, and it is for him to keep observation on the children when they return and so minimise the risk of recurrence.

SWISS MEDICAL YEAR BOOK.

WE have received a copy for 1930 of this attractive calendar, which blossomed out last year into a handsome cloth-bound quarto volume. All the characters to which we then called attention have been retained, the year book has been brought scrupulously up to date, and additional care has been taken to make the information it contains easy of access. The book is ambitious in combining the scope of a medical directory and a medical annual, for the first 90 pages are given up to biographies and clinical summaries. Two great living Swiss clinicians, César Roux and Hermann Sahli, have their life-work set out in detail, and there is a delayed obituary notice of Carl Garrè. In the clinical survey Prof. F. de Quervain writes on the position of surgery, Prof. Paul Ernst of Heidelberg on waves in medical thought, Dr. A. Rollier on an international industrial clinic for poor persons suffering from surgical tuberculosis, and Prof. O. Veraguth on physical therapy. The year book is published by Benno Schwabe and Co. in Basle at 11 Swiss francs.

THE DUTCH PESSARY.

To the Editor of THE LANCET.

SIR,—The suggestion made in your admirable annotation on birth control (THE LANCET, July 19th, p. 147) that some British clinics may be using too small a size of occlusive pessary* is challenged in a subsequent letter from Dr. Norman Haire. Neither

*In this country we mostly prefer the coiled spring of the Ramses to the watch spring of the Mensinga, but the principle of fitting is the same.

the letter nor the annotation draw attention to the real danger of the smaller sizes—namely, that the patient may insert the ring between the anterior fornix of the vaginal vault and the symphysis pubis. The pessary must be large enough to make this impossible, except, perhaps, in the case of intelligent patients with long fingers who can be trusted to discover for themselves whether or no the cervix is covered. Otherwise the penis will reach the cervix between the pessary and the posterior wall of the vagina. Pessaries that are too large lie too nearly in the axis of the vagina (or, "too obliquely," as Dr. Haire would say). The danger in that case is that the penis may pass to the cervix between the pessary and the anterior wall of the vagina. Between these two misfits there is found one size, and usually not more than one size, that fits the patient, and is more or less fool-proof. In my experience this size is rarely less than 70 mm., and not very commonly more than 75 mm.

I am, Sir, yours faithfully,

J. ROSSLYN EARP.

Denver, Colorado, U.S.A., Sept. 5th, 1930.

*** The statistical evidence presented to the Zürich Congress was, as we noted last week (p. 650), unambiguous in its preference for the larger pessaries. —ED. L.

Appointments

DOHERTY, D., L.R.C.P., L.R.C.S. Edin., L.R.F.P.S. Glasg. has been appointed Temporary Assistant Medical Officer of Health, Donegal.

HUTTON-ATTENBOROUGH, E. A., M.B., B.S. Lond., Medical Referee under the Workmen's Compensation Act for County Court Circuit, No. 20.

LEWIS IVOR, M.D., M.S. Lond., Medical Superintendent, City Hospital, Plymouth.

Dewsbury Infirmary: CHAMBERLAIN, DIGBY, F.R.C.S. Eng., and MOIR, P. J., *M.C.*, F.R.C.S. Eng., Honorary Visiting Surgeons.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.: HATRICK, J. C., M.B., B.S., Senior Resident Medical Officer; NIXON, W. C. W., F.R.C.S. Eng., Assistant Resident Medical Officer; O'LEARY, MARY, L.R.C.P. Lond., M.R.C.S., D.P.H., District Resident Medical Officer.

Vacancies

For further information refer to the advertisement columns.

Alderley Edge, Ancoats Hospital Convalescent Home, Great Warford.—Hon. Visiting Physician. £50.

Alton, Hants, Lord Mayor Treloar Cripples' Hospital and College. 3rd Asst. Res. M.O.

Aylesbury, Royal Buckinghamshire County Hospital.—Hon. Consulting Surgeon to Throat, Nose, and Ear Dept.

Bath, Royal United Hospital.—H.S. At rate of £200.

Belgrave Hospital for Women, 1, Clapham-road, S.W.—H.S. and Two H.P.'s. Each at rate of £100.

Belgrave Hospital Infant Welfare Centre, 212, Camberwell New-road, S.E.—M.O. 1½ gns. per session.

Birmingham and Midland Eye Hospital, Church-street.—H.S. £110.

Blackburn Royal Infirmary.—4th H.S. £150.

Bootle General Hospital.—Hon. Ophth. Surgeon.

Burnley, Victoria Hospital.—H.P. At rate of £150.

Cambridge, Addenbrooke's Hospital.—H.S. Also Res. Anæsthetist and Emergency Officer. Each at rate of £130.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road.—Two Hon. Assts. for Out-patient Department.

Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100–£175.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Colchester, Essex County Hospital.—Asst. H.S. and Reg. £120.

Connaught Hospital, Orford-road, E.—Res. H.S. At rate of £100.

Croydon General Hospital.—H.S. £125.

Eastbourne, Princess Alice Memorial Hospital.—H.S. At rate of £150.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. At rate of £150.

Edinburgh, Dept. of Health for Scotland.—Regional M.O. in connexion with National Health Insurance Med. Service. £1000.

Edinburgh Royal Infirmary.—Radiologist, &c. £1500.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—H.S. to Special Depts. At rate of £150.

Frimley Sanatorium.—Jun. H.P. At rate of £100.

Gloucester County and City Mental Hospitals.—Jun. Asst. M.O. £350.

Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Second H.S. At rate of £120.

Great Yarmouth General Hospital.—Jun. H.S. At rate of £140.

Grimsby and District Hospital.—Res. M.O. £200.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Dental S.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Asst. P. Also Res. H.S.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50 for six months.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100.

Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150.

Lancaster County Mental Hospital.—Asst. M.O. £350.

L.C.C.—Eighth Asst. M.O. for Mental Hospital Service. £44

Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O. At rate of £200.

Liverpool, Alder Hey Children's Hospital.—Res. Asst. M.O. £20

Liverpool, Mill-road Infirmary.—Res. Asst. M.O. £200.

Liverpool Royal Babies' Hospital, Woolton.—Res. M.O. At rate of £90.

Liverpool, Smithdown-road Institution.—Res. Asst. M.O. £200

Liverpool, St. Paul's Eye Hospital, Old Hall-street.—H.S. At rate of £120.

Liverpool, Walton Hospital.—Res. Asst. M.O. £200.

Macclesfield General Infirmary.—H.S. At rate of £180.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Hon. Ophth. S.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Manchester, Monsall Hospital for Infectious Diseases.—Jun. M.O. £350.

Manchester, Withington Hospital, &c.—Asst. M.O. £350.

Merthyr General Hospital.—Res. H. S. At rate of £150.

Middlesex Hospital, W.—Aural Surgeon. Dental Surgeon. Assistant Radiologist. £150.

Ministry of Health.—Deputy Regional M.O. in connexion with National Health Insurance Medical Service. £800.

Monmouthshire C.C.—Asst. M.O. £500.

Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Res. Med. Asst. £350.

Newcastle-upon-Tyne, General Hospital.—Sen. H.P. £300.

Newcastle-upon-Tyne, Hospital for Sick Children.—Hon. Opht Surgeon.

Oldham Royal Infirmary.—Two H.S.'s. Each at rate £175.

Paddington Green Children's Hospital, W.—H.P. and H. Each £150.

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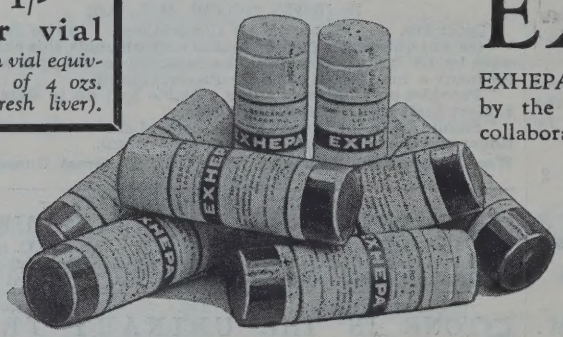

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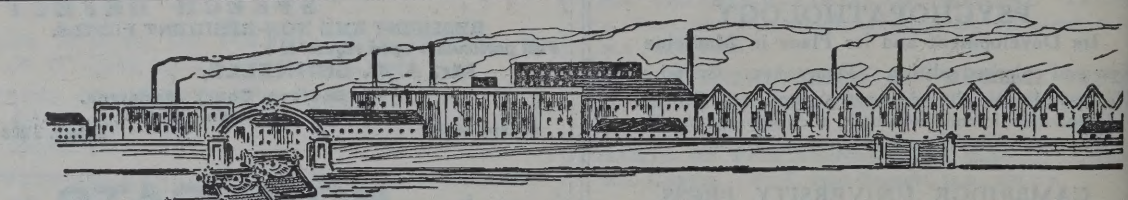

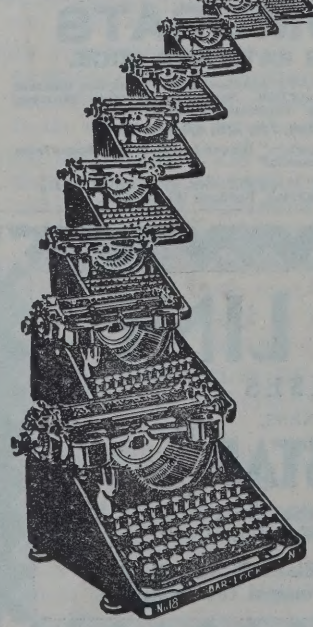

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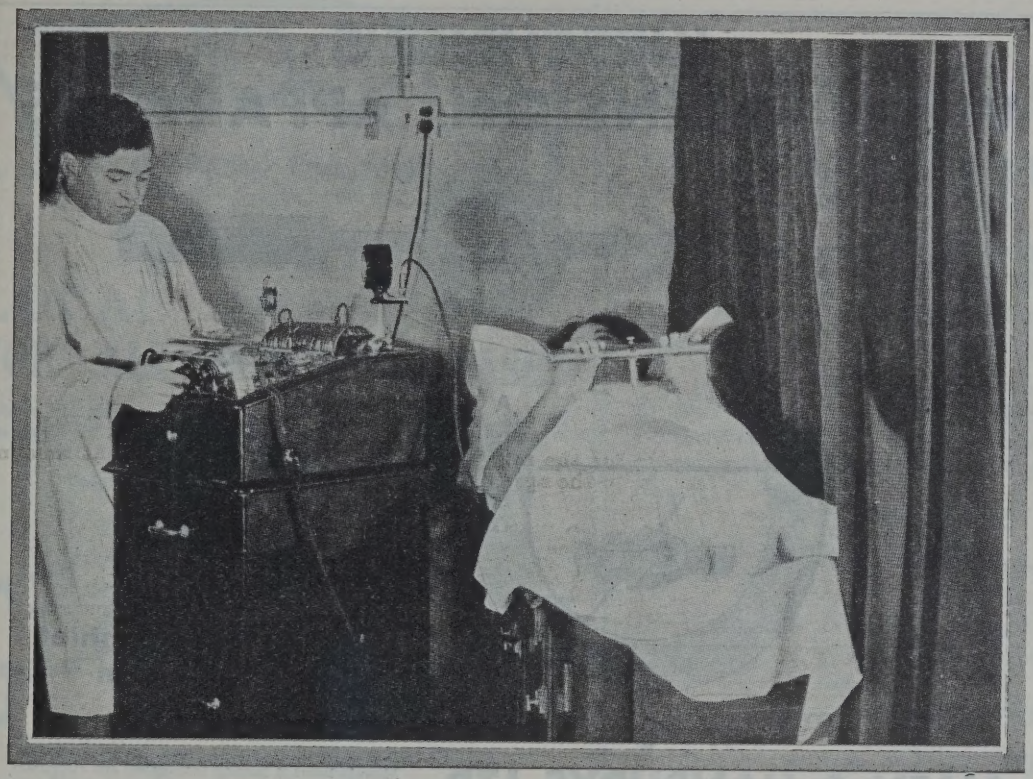

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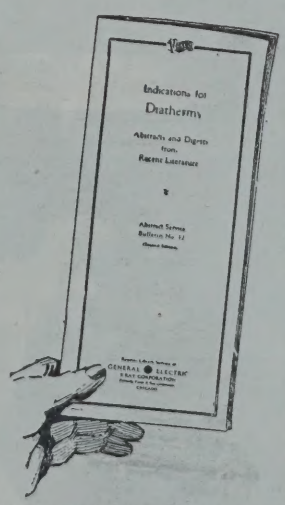

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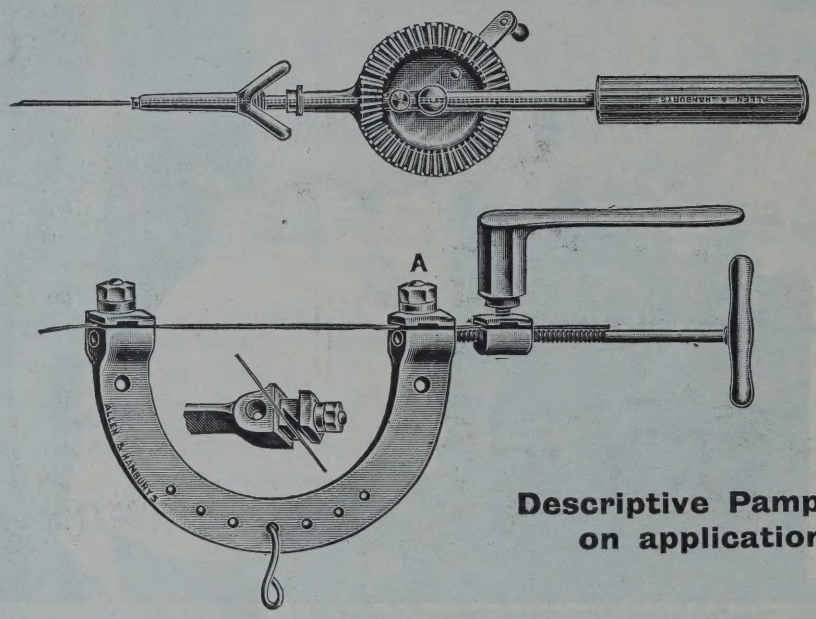

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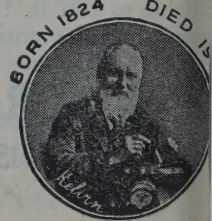

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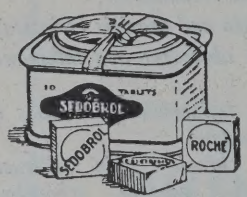

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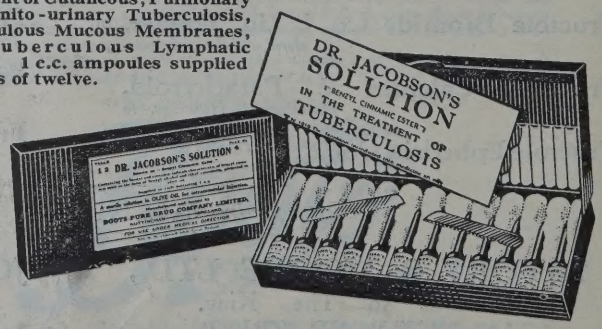

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Other references: B.M.J., June 15, 1929, p. 1070. B.M.J., June 28, 1930.

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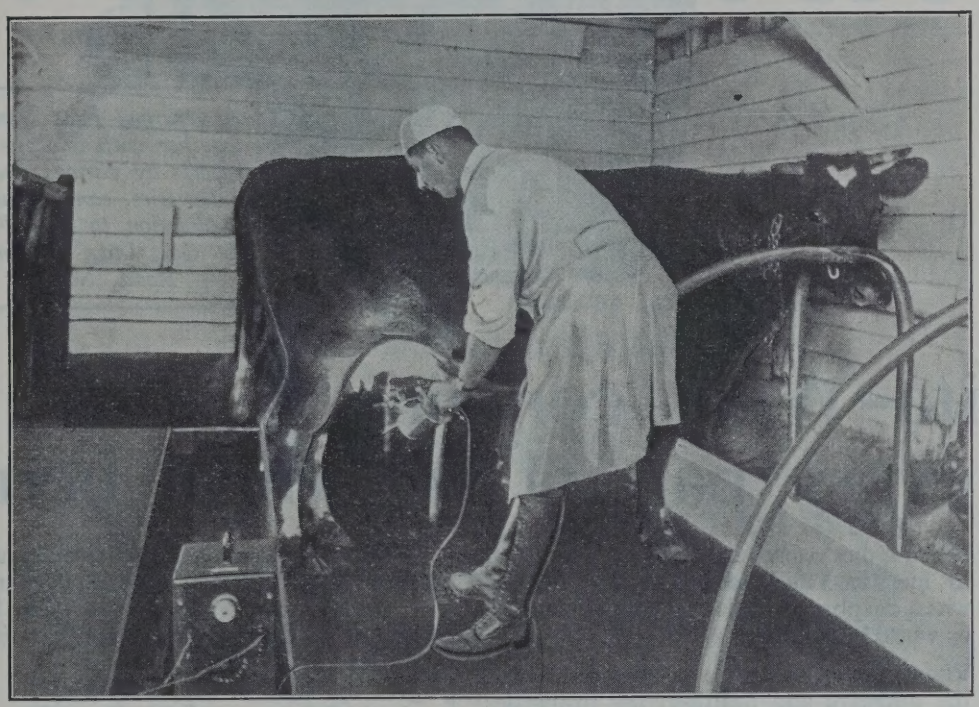

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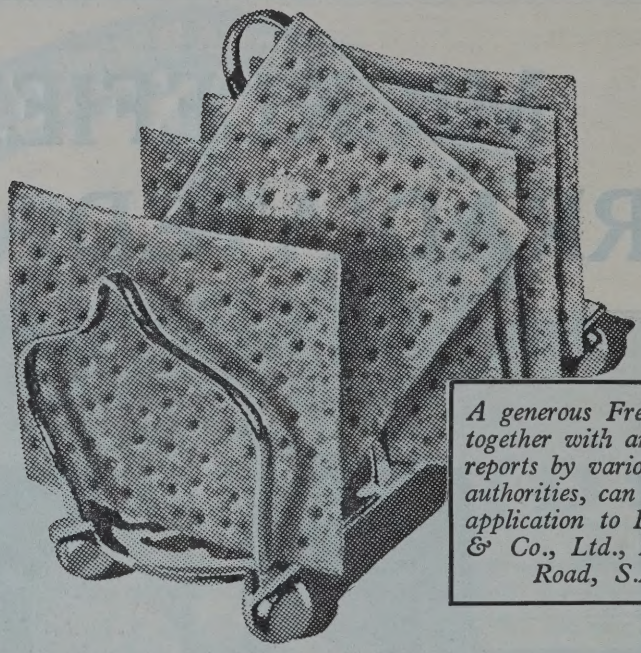

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MEDULLA RUBRA

BONE-MARROW IN ANÆMIA FROM HÆMORRHAGE

W. Borchardt (*Deut. med. Woch.*, March 28th, 1930, p. 521) records the results of his experiments on young dogs in which anæmia had been artificially produced by the removal of about half their blood. In the first series some of the animals were fed with rib-marrow, others with marrow from the long bones. Control animals received a corresponding amount either of fat or of liver extract. The basal diet in each case contained a sufficiency of iron (5 mg. per cent.). Only the animals receiving the red rib-marrow showed a definite increase of weight, and their hæmoglobin formation was more rapid than that of the others. In the next series the experiment was repeated, but the iron content of the diet was reduced to 1·4 mg. per cent. The result was similar but more striking, the dogs receiving the rib-marrow regaining their hæmoglobin far more quickly than the others.

THIS extract from the "Epitome of Literature," published in the "BRITISH MEDICAL JOURNAL" dated May 3rd last, is important as representing, in 1930, a complete justification of the formula upon which

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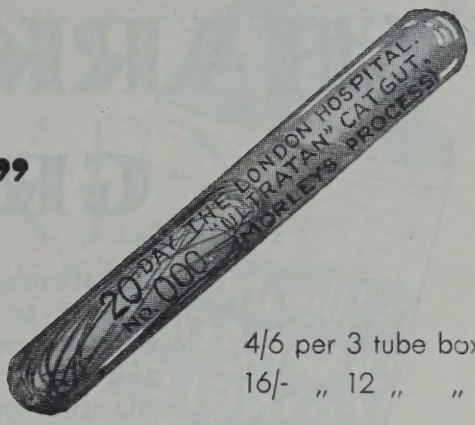

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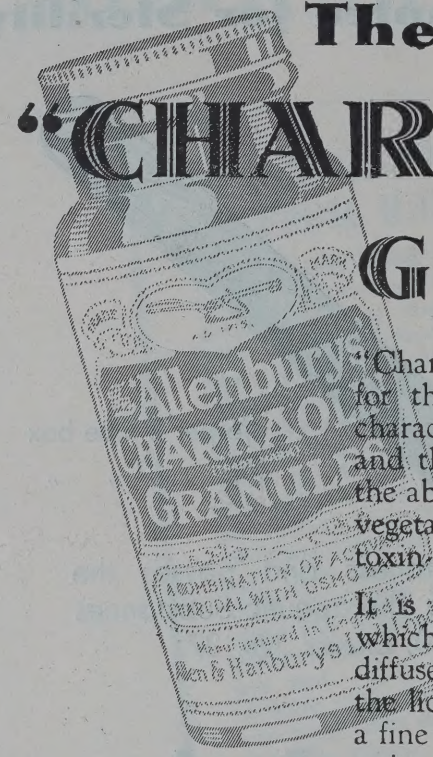

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It is in the form of fine, clean granules which disintegrate rapidly in water and diffuse their ingredients evenly throughout the liquid. "Charkaolin" is tasteless, forms a fine suspension in water and is, therefore, quite easy to take.

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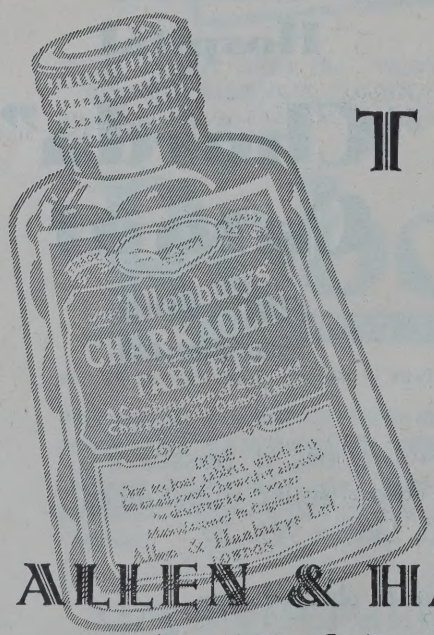

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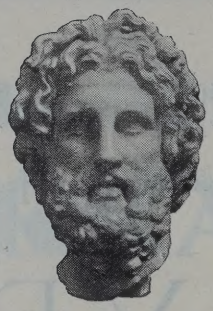

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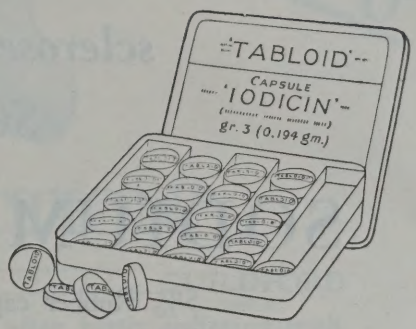

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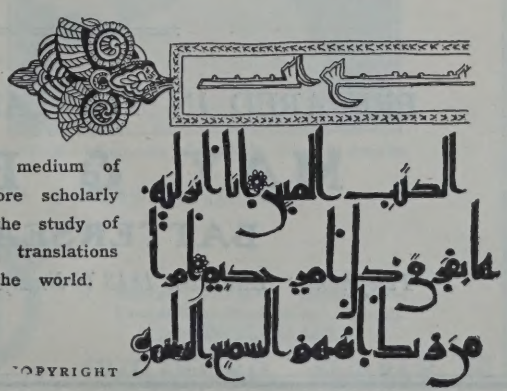

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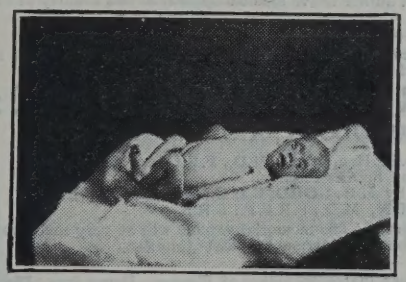

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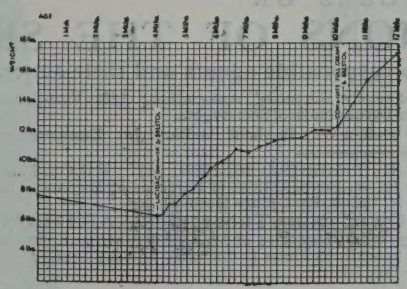

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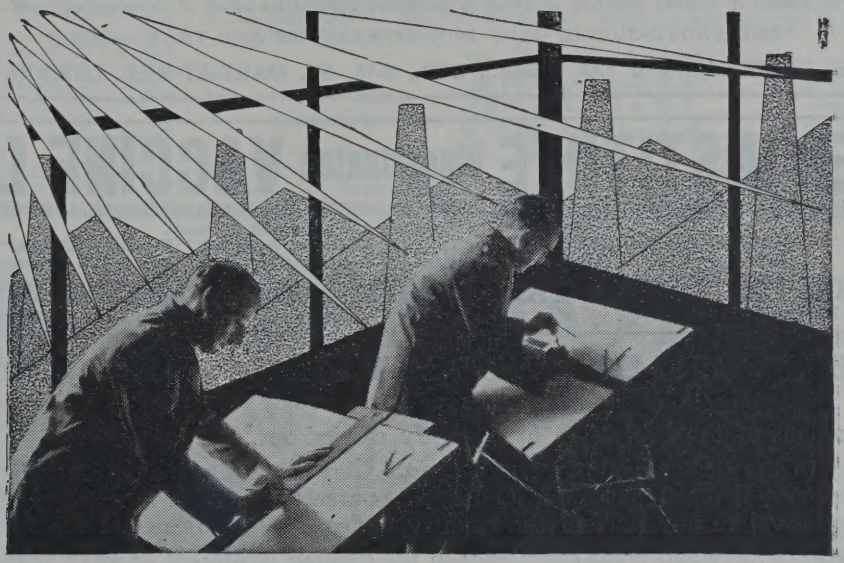

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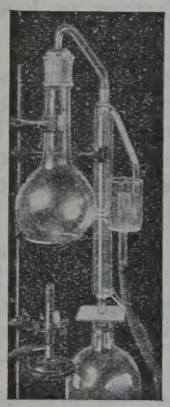

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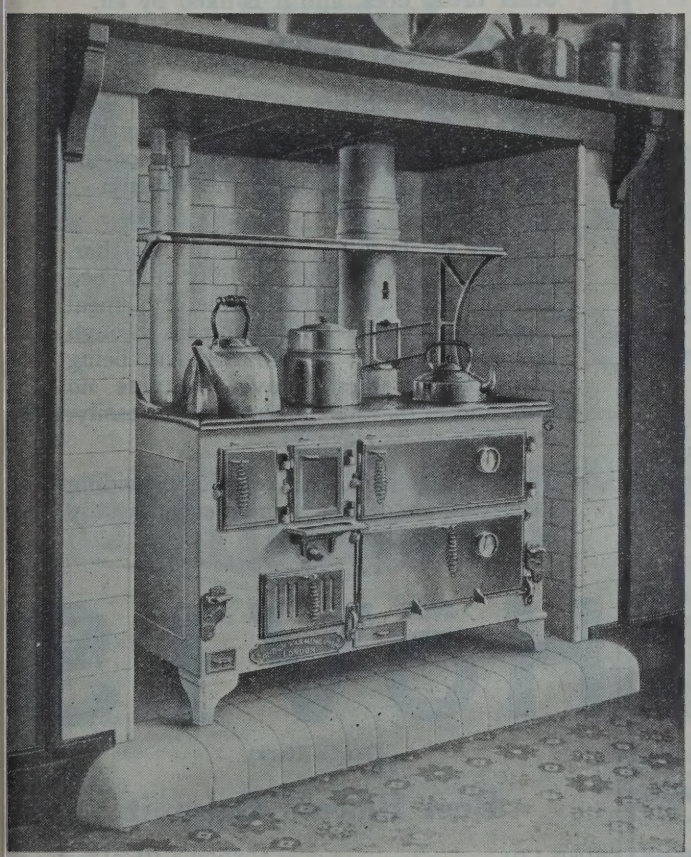

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Professor G. F. Still, M.A., M.D., LL.D., F.R.C.P., Physician for Diseases of Children, at the Hospital, will preside.

All past Students of the Medical School are cordially invited to attend.

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at which Professor Sir St Clair Thomson, M.D., F.R.C.P., F.R.C.S., will preside, will be held the same evening at 7 for 7.30 at the Connaught Rooms, Great Queen-street, Kingsway, W.C. 2.

The Dean and the Dinner Secretaries (Dr. Ernest Playfair and Dr. G. de Bec Turtle) trust that Past and Present Members of the School will endeavour to be present on this special occasion, and they will be glad to be informed if any Member has not received his or her invitation.

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Reliable and Experienced Nurses for all Cases at all Hours.
Special Staff for Mental "Borderline," Neurasthenia, and Nerve Cases.

Telephone: WELBECK 2253. Terms £3 : 3 : 0 to £4 : 4 : 0 per week. Telegrams: "NURSINGDOM, LONDON." Apply M. SULLIVAN, Secretary.

THE COPPICE, NOTTINGHAM,

HOSPITAL FOR MENTAL DISEASES.

President: The Right Hon. the EARL MANVERS.

This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted. For terms, &c., apply to the Medical Superintendent.

FEATHERSTONE HALL

SOUTHALL, MIDDLESEX.

A small PRIVATE HOME for the care and treatment of Ladies suffering from MENTAL DISORDERS. Voluntary Boarders received. Large Secluded Garden.
Apply to the Medical Superintendent. Tel.: Southall 0034.

BARNWOOD HOUSE, GLOUCESTER.

A REGISTERED HOSPITAL FOR THE CARE AND TREATMENT OF LADIES AND GENTLEMEN SUFFERING FROM NERVOUS AND MENTAL DISORDERS.

Within two miles of the G.W. Railway and L.M. & S. Railway Stations at Gloucester, the Hospital is easily accessible by rail from London and all parts of the United Kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of over 280 acres. Voluntary Boarders of Both Sexes are also received for treatment.
Special accommodation for Lady Voluntary Boarders is also provided at the MANOR HOUSE, which has its own private grounds and is entirely separate from the main Hospital.
For particulars as to terms, &c., apply to ARTHUR TOWNSEND, M.D., Resident Superintendent.
Telephone: No. 7 Barnwood.

KILLEADEN HOUSE,

KILTIMAGH,
Co. MAYO, IRELAND.

A PRIVATE HOME for the care and treatment of a limited number of NERVE AND EPILEPTIC PATIENTS. Family life with individual attention. Trained Nurse. Grounds 100 acres. Out-door life and recreations. Medical references England—Ireland.

For Terms apply Lady Superintendent.

STRETTON HOUSE

Church Stretton, Shropshire.

A PRIVATE HOME for the treatment of gentlemen suffering from Mental and Nervous Illness, including the allied Disorders of Alcoholism and the Drug Habit. All types of early Mental and Nervous Cases are received without certificates as Voluntary Boarders. Bracing hill country. See "Medical Directory," p. 2219.—Apply to Medical Superintendent. 'Phone 10 P.O., Church Stretton.

ASHWOOD HOUSE

KINGSWINFORD, STAFFORDSHIRE.

An old-established home-like Institution for the treatment of MENTAL AFFECTIONS in BOTH SEXES. Probationary cases and non-certified patients are received as well as those regularly certified.

Full particulars as to reception terms, &c., may be obtained from the Resident Medical Officer.

CLARENCE LODGE

CLAPHAM PARK, LONDON.

Situated in 3½ acres of secluded gardens.

HOME FOR TWELVE MENTAL PATIENTS (LADIES).

Well-appointed private house. Home comforts and Trained Nursing Staff. Eminent Mental Specialist Visiting Physician.

A new feature in the Home is the Ultra Violet Ray Treatment.

Station: Clapham Common Tube.
Phone: Brixton 0494
Apply: MRS. THWAITES.

CHEADLE ROYAL,

CHEADLE, CHESHIRE.

This Registered Hospital for Mental Diseases with its seaside branch Glan-y-don, Colwyn Bay, is for the treatment and care of PRIVATE PATIENTS of the UPPER and MIDDLE CLASSES. Voluntary Boarders received.
For terms, &c., apply to the Medical Superintendent, J. A. C. Roy, M.B., who may be seen in Manchester by appointment. Telephone: No. 481 GATLEY.

PORTSMOUTH CITY MENTAL HOSPITAL.

Accommodation is provided for the reception of PRIVATE PATIENTS of both sexes in three detached Villas, which are healthily and pleasantly situated in extensive grounds with sea views.
Charges from 3 guineas weekly, including all necessaries except clothing.—Apply to the Medical Superintendent and Resident Physician, THOMAS BEATON, O.B.E., M.D., M.R.C.P.

THE WARNEFORD, OXFORD.

HOSPITAL FOR MENTAL DISORDERS.

President: The Right Hon. the EARL OF JERSEY.

This Registered Hospital, for the Treatment and Care, at moderate charges, of Mental Patients belonging to the educated classes, stands in a healthy and pleasant situation on Headington Hill, near Oxford. Voluntary Boarders are also received for treatment.—For further particulars apply to the Medical Superintendent.

CHISWICK HOUSE

A PRIVATE MENTAL HOSPITAL FOR THE TREATMENT AND CARE OF MENTAL AND NERVOUS DISORDERS.

Now removed to—

CHISWICK HOUSE, PINNER, MIDDLESEX.
Pinner 234.

A modern country house 12 miles from Marble Arch, in beautiful and secluded grounds.
Fees are from 10 guineas a week.
Voluntary Patients received for treatment.
DOUGLAS MACAULAY, M.D., D.P.M.

LITTLETON HALL, BRENTWOOD, ESSEX

(18 MILES FROM LONDON.)
400 feet above sea.

HOME for few LADIES Mentally Afflicted. Large grounds. Liverpool st. 26 min. Stations: Brentwood, Shenfield, one mile. Boarders Received. Apply Dr. Haynes. Telephone and Telegrams: Haynes, Brentwood 45.

ST. ANDREW'S HOSPITAL
FOR MENTAL DISORDERS,
NORTHAMPTON

FOR THE UPPER AND MIDDLE CLASSES ONLY.

PRESIDENT: THE MOST HON. THE MARQUESS OF EXETER, C.M.G., A.D.C.
MEDICAL SUPERINTENDENT: DANIEL F. RAMBAUT, M.A., M.D.

This Registered Hospital is situated in 120 acres of park and pleasure grounds. Voluntary Boarders, persons suffering from incipient nervous and mental disorders, as well as certified patients of both sexes, are received for treatment. Careful clinical, bio-chemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital, in detached grounds with a separate entrance, to which patients and voluntary boarders can be admitted. It is equipped with all the apparatus for the most modern treatment of Mental and Nervous Disorders. It contains special departments for hydrotherapy by various methods, including Turkish and Russian Baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, &c. There is an operating Theatre, a Dental Surgery, an X-ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High Frequency treatment. It also contains Laboratories for bio-chemical, bacteriological, and pathological research.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit and vegetables are supplied to the Hospital from the farm, gardens and orchards of Moulton Park. Occupation therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The Seaside house of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Voluntary Boarders or Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard court), croquet grounds, golf courses and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts such as carpentry, &c.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: No. 56 Northampton), who can be seen in London by appointment.

THE OLD MANOR SALISBURY

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS.

Extensive grounds. Detached Villas. Chapel. Garden and dairy produce from own farm. Terms very moderate.

CONVALESCENT HOME AT BOURNEMOUTH standing in 12 acres of ornamental grounds, with tennis courts, etc., which Patients or Boarders may visit, by arrangement for long or short periods.

Illustrated Brochure on application to the Medical Superintendent, The Old Manor, Salisbury. Telephone: 51.

SHAFTESBURY HOUSE

FORMBY-BY-THE-SEA, Nr. LIVERPOOL.

Specially built and licensed for the care and treatment of a limited number of Ladies and Gentlemen suffering **from NERVOUS or MENTAL breakdown. Voluntary boarders received. Psycho-Therapy in** suitable **cases if desired. Terms moderate.** *Apply* **RESIDENT PHYSICIAN.** *Tel. No. 8 Formby.*

CAMBERWELL HOUSE,

Telegrams: "PSYCHOLIA, LONDON." **33, PECKHAM RD., LONDON, S.E.5.** **Telephone: Rodney 4731, 4732**

For the Treatment of MENTAL DISORDERS.

Also completely detached Villas for Mild Cases, with private suites if desired. Voluntary Patients received. Twenty acres of grounds, Hard and Grass Tennis Courts, Bowls, Croquet, Squash Rackets, and all indoor amusements, including Wireless and other Concerts. Occupational Therapy, Physical Drill, and Dancing Classes. X-ray and Actino-therapy, Prolonged Immersion Baths, Operating Theatre, Dental Surgery, and Ophthalmic Department. Chapel.

Senior Physician: DR. HUBERT JAMES NORMAN, assisted by three Medical Officers, also resident, and Visiting Pathologist.

An Illustrated Prospectus may be obtained upon application to the Secretary.

HOVE VILLA, BRIGHTON.—Convalescent Branch of the above.

HAYDOCK LODGE,
NEWTON-LE-WILLOWS, LANCASHIRE.

For the reception and treatment of PRIVATE PATIENTS of both sexes of the UPPER AND MIDDLE CLASSES either voluntarily or under Certificate. Patients are classified in separate buildings according to their mental condition.

Situated in park and grounds of 400 acres. Self-supported by its own farm and gardens in which patients are encouraged to occupy themselves. Every facility for indoor and outdoor recreation. For terms, prospectus, etc., apply MEDICAL SUPERINTENDENT. *Phone:* **11 Ashton-in-Makerfield.**

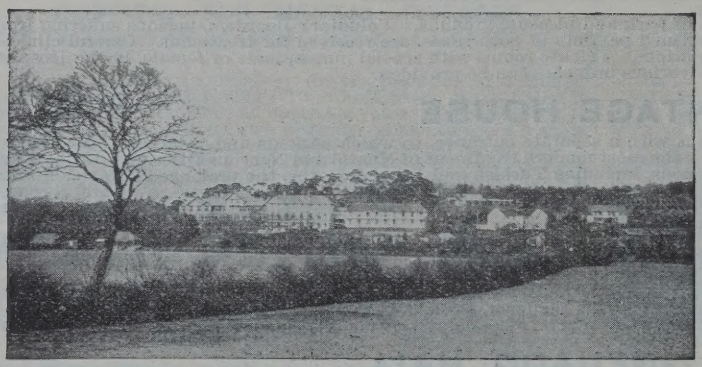
PECKHAM HOUSE, 112, Peckham Road, London, S.E. 15

Telegrams: "Alleviated, London." **Telephone: Rodney 4741 and 4742.**

The above House, which was established in 1826, is an Institution for the care and treatment of persons suffering from mental diseases and nervous disorders. Both certified patients and Voluntary Boarders are received. Separate houses for treatment and accommodation of special cases adjoin the Institution. There is a seaside branch, Kearsney Court, near Dover, to which patients may be sent for treatment or on holiday. Motor and carriage exercise is provided as required. Patients can avail themselves of a course of physical drill. Tennis courts. Entertainments, dances and indoor amusements held throughout the year.

Illustrated prospectus and further particulars can be obtained from the MEDICAL SUPERINTENDENT.

MUNDESLEY SANATORIUM



Specially built for the treatment of Tuberculosis. **Spacious public rooms recently completed in a new central building.** Aspect S.S.W., on a carefully chosen site. Pure, bracing air. High sunshine record. Heliotherapy. Arc-light treatment. One mile from the coast. Electric light throughout. X-Ray installation. Full day and night Nursing Staff. Wireless (headphones) throughout.

Resident Physicians:

S. VERE PEARSON, M.D.(Camb.), M.R.C.P.(Lond.),
L. WHITTAKER SHARP, M.B.(Camb.).
ANDREW MORLAND, M.D. (Lond.)., M.R.C.P.

Apply: Mr. D. C. FORD, Secretary,
The Sanatorium, Mundesley, Norfolk.
Telephone: Mundesley 4.

RUTHIN CASTLE

(Formerly Duff House, Banff).

The first Private Hospital in the United Kingdom to be fully provided with a whole-time specially qualified Staff of Doctors, Analytical Chemists, Bacteriologists, Radiologists, Nurses, Dietists, Masseurs, and Masseuses, and a full equipment of Laboratories, X-rays, Electrocardiograph, Artificial Sunlight, and Medical Baths.

The Hospital is equipped for the diagnosis and treatment of any form of ill-health, except Mental and Infectious Diseases. The fees are inclusive.

The climate is mild and the neighbourhood beautiful.

Apply: THE SECRETARY,
Ruthin Castle, North Wales.

Telegrams: CASTLE RUTHIN. *Telephone:* 66 RUTHIN.

PRIOR PLACE SANATORIUM

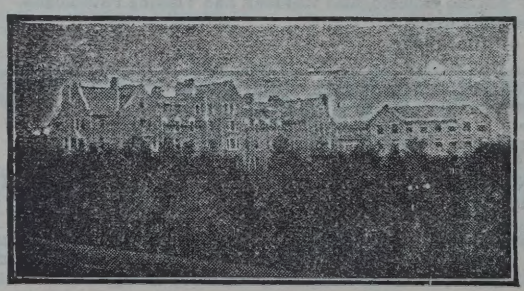
HEATHERSIDE, CAMBERLEY.

RECENTLY OPENED FOR THE TREATMENT OF PULMONARY TUBERCULOSIS.
WELL SITUATED ON HIGH GROUND AND SURROUNDED BY PINES AND HEATHER.

RESIDENT MEDICAL SUPERINTENDENT: Dr. H. O. BLANFORD, late Medical Superintendent, King Edward VII. Sanatorium, Midhurst, to whom applications for particulars may be made.

TOR-NA-DEE SANATORIUM

MURTLE, DEESIDE, ABERDEENSHIRE



Medical Director: DAVID LAWSON, M.D., F.R.S.E.

FULLY EQUIPPED WITH *EVERY MODERN APPLIANCE* FOR THE DIAGNOSIS AND TREATMENT OF ALL FORMS OF TUBERCULOSIS & ALLIED DISEASES.

Physician Superintendent: J. M. JOHNSTON, M.B., D.P.H., etc.

Full particulars and Prospectus on application to the Secretary.

INCLUSIVE TERMS: SEVEN GUINEAS A WEEK

VALE OF CLWYD SANATORIUM.

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea level, on the South-West slopes of mountains rising to over 1800 feet, which protect it from north and east winds and provide many miles of graduated walks with magnificent views. Average rainfall 29·57 per annum. Full day and night Nursing Staffs. X Ray plant. Every facility for Artificial Pneumothorax and for operations on the chest. Electric Lighting. Central Heating. Home Farm. Grade A Milk from T.T. Herd.

For particulars apply to Medical Superintendent:
H. MORRISTON DAVIES, M.D., M.Ch., (Cantab.), F.R.C.S:, Llanbedr Hall, Ruthin, N. Wales.

THE COTSWOLD SANATORIUM

Specially built in 1898 on the Cotswold Hills, seven miles from Cheltenham, for the treatment of Pulmonary and all other forms of Tuberculosis. Aspect S.S.W., sheltered from North and East, elevation 800 feet. Pure bracing air. SPECIAL TREATMENT by artificial PNEUMOTHORAX (X-Ray controlled), TUBERCULINS, and ULTRA-VIOLET RAYS is available when necessary without extra charge. X-RAY plant. Electric light Radiators, hot and cold basins, and Wireless in all rooms. Full day and night Nursing Staff.

Resident Physicians: ARTHUR H. HOFFMAN, M.D. St. Andrews, GEOFFREY A. HOFFMAN, B.A., M.B., T.C. Dub., and MARGARET A. HARRISON, M.B., B.S. Lond. *Apply: The Secretary, The Cotswold Sanatorium, Cranham, Gloucester.*
Telephone: 41 Witcombe. Telegrams: "Hoffman, Birdlip."

PENDYFFRYN HALL SANATORIUM

PENMAENMAWR, NORTH WALES.

Specially established in 1900 for carrying out the open-air treatment of TUBERCULOSIS on Nordrach lines. Now supplemented by Artificial Pneumothorax (X-Ray control) and other more recent methods when necessary.

The Sanatorium, situated in its own Park with fine sea and mountain views, has the advantage of miles of specially laid out and graduated walks rising through the pine-clad hills. There is a full Day and Night Nursing Staff. Equipment is modern; Electric Light, Central Heating, Wireless installed. Milk is specially obtained from a herd of tuberculin-tested cattle. Communication direct with LONDON, IRELAND, LIVERPOOL, and Midland Towns. (L. M. & S. Main Line.)

Senior Physician—DENNISON PICKERING, M.D.
Assistant Physician—J. L. FAULL, M.R.C.S., L.R.C.P.
For particulars apply to the Secretary, Pendyffryn Hall, Penmaenmawr, N. Wales. 'Phone 20.

DARTMOOR SANATORIUM. 750 FEET ABOVE SEA-LEVEL

Established 1903 for Treatment of Pulmonary and other forms of Tuberculosis. Sheltered Situation on the slopes of the bracing Moorland. Radiographic Installation, Electric Light, Central Heating, Separate Bedrooms, Efficient Treatment combined with individual comfort and minimum restrictions. Illustrated Prospectus on request to the Resident Physician: C. H. BERRY, M.R.C.S., L.R.C.P., Dartmoor Sanatorium, Chagford, Devonshire. Telephone: 11 CHAGFORD.

PARK SANATORIUM

(FORMERLY SANATORIUM TURBAN)

DAVOS-PLATZ, SWITZERLAND.

First-class house, 5,150 ft. above sea-level. Large park and wood belonging to the sanatorium. Terms for board and residence, including room, medical treatment, etc., from £5 12s. per week. Prospectus.

Medical Superintendent, F. BAUER, M.D.

INEBRIETY.

Telephone: 16 Rickmansworth.

DALRYMPLE HOUSE, RICKMANSWORTH, HERTS.,

For the treatment of Gentlemen under the Act and privately. Established 1863 by an association of prominent medical men and others for the study of inebriety; profits, if any, are expended on the institution. Large secluded grounds on the banks of the river Colne. Full-sized billiards, tennis, croquet, bowls. Golf (Moor Park and Sandy Lodge) close by.—Apply to F. S. D. HOGG, M.R.C.S., &c., Res. Med. Supt.

ALCOHOLISM, DRUG HABIT and NEURASTHENIA.

BAY MOUNT, PAIGNTON.

Ladies and Gentlemen treated in small Private Home.

EXCELLENT RESULTS FROM MODERN TREATMENT.
SPLENDID CLIMATE. AMPLE AMUSEMENT.
MODERATE INCLUSIVE TERMS.
Prospectus, report, etc., from STANFORD PARK, M.B., Ch.B., Res. Med. Supt. *Phone: Paignton 5110.*

FUNCTIONAL NERVOUS DISORDERS ALCOHOLISM and DRUG ADDICTION

at CALDECOTE HALL, NUNEATON.

This Mansion has been opened upon the most modern and scientific lines both physical and mental.
Resident Medical Superintendent—
A. E. CARVER, M.A., M.D., M.R.C.S., D.P.H., D.P.M.
Full particulars upon request.
Prospectus from the SECRETARY, 40, Marsham Street, Westminster, S.W.

ALCOHOLISM, OTHER DRUG HABITS, and TROPICAL Ailments

THE HARE NURSING HOME

As founded and established by the late Dr. FRANCIS HARE, for 20 years Med. Supt. of The Norwood Sanatorium, and author of "Alcoholism," etc.; for the treatment of ALCOHOLISM, other Drug Habits, Insomnia, Neurasthenia, Functional Nervous Disorders, TROPICAL Ailments, etc.

"THE OLD HILL HOUSE," CHISLEHURST, KENT.

Terms Moderate. Quiet and pleasant situation.
Ladies and gentlemen admitted for treatment.
For Prospectus, etc., write or 'phone, **WALTER E. MASTERS, M.D., M.R.C.S., D.P.H.,** Barrister-at-law (Res. Med. Supt.).
'Phone: Chislehurst 451. Telegrams: "Masters," Chislehurst.

YARROW HOME and HOSPITAL for CHILDREN,

BROADSTAIRS.

For the early and Preventive Treatment of Diseases and Convalescence after Illness.

The Hospital is intended for the Children of Members of the Institution of Civil Engineers, the Children of Architects, Artists, Authors, Clergymen, Members of the Medical, Legal and other Professions, Members of Scientific Societies, Officers of the Navy, Army and Royal Air Force, Officers of the Merchant Navy, Schoolmasters, and University Professors.

Accommodation is provided for 50 Boys between the ages of 4 and 12 years, and 50 Girls between the ages of 4 and 14 years. In special cases the age limits may be raised to 14 for Boys and 16 for Girls.

Fee 21/- per week

or as may be arranged, and travelling expenses.

Particulars can be obtained from the Secretary :—

116, Victoria Street, Westminster, LONDON, S.W.1

SMEDLEY'S HYDRO.

MATLOCK. Established 1853.

Physicians: G. C. R. Harbinson, M.B., B.Ch.
R. MacLelland, M.D., C.M.(Edin.).

Prospectus and full information on application to the Manager.

PEEBLES HYDRO.

Beautifully situated 600 feet above sea level. Facing South, completely sheltered from North and East.
21 miles from Edinburgh.

All modern Baths, Douches, Massage and Electrical Treatment Ultra-violet Radiation. Physician in Attendance

IDEAL HEALTH RESORT.

Electric Light, Central Heating, Electric Lift, Three Billiard Tables, Ball Room, Winter Garden, Swimming Bath, Hard and Grass Tennis Courts, Badminton, Croquet Lawn, Golf Course.
Prospectus from Manager. 'Phone: Peebles 2.

NORTHUMBERLAND HOUSE

GREEN LANES,

FINSBURY PARK, N.4.

A PRIVATE HOME for the treatment of patients of both sexes suffering from Mental Illnesses.

Private suites. Voluntary Boarders received without certificates.

For further particulars apply to the Medical Superintendent.
Tel.: North 0888. Telegrams: "SUBSIDIARY, LONDON."

SPRINGFIELD HOUSE

Phone: BEDFORD 3417.] **Near BEDFORD**

For Mental Cases with or without Certificates

Ordinary Terms Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).

For forms of admission, &c., apply to the Drs. BOWER, as above, or at 15, Duchess-street, Portland-place, W.1, on Tuesdays from 4 to 5.

BAILBROOK HOUSE,

BATH

A PRIVATE HOSPITAL for the Care and Treatment of persons with Mental and Nervous Disorders.

Voluntary Boarders received in the Villas. Large Mansion on outskirts of Bath, with 20 acres of grounds (see *Medical Directory, page* 2226).

For terms apply to SAMUEL J. GILFILLAN, O.B.E., M.B., C.M. Edin., Resident Physician.
Telephone No.: BATHEASTON 8189.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.

Terms Moderate: Apply to Resident Medical Superintendent.
Telegrams: ADAM WEST MALLING. Telephone: No. 2 MALLING.

PRIVATE PATIENTS.

London County Council.—

Accommodation for Male Paying Patients is provided at the LONDON COUNTY MENTAL HOSPITAL, Claybury, Woodford Bridge, Essex.

The hospital is thoroughly equipped for modern treatment of certified cases.

Terms, exclusive of clothing and special luxuries, for patients having a legal settlement in the County of London, 44s. 11d. a week; for others, 48s. 5d. a week.

Full particulars from the Medical Superintendent, Claybury Mental Hospital, or from the Acting Chief Officer, Mental Hospitals Department, The County Hall, S.E.1.

Telegraphic Address: "Relief, Old Catton." Telephone: 290 Norwich.

NERVOUS & MENTAL AFFECTIONS.

Ladies only received.

The Grove, Old Catton, Norwich.—

A High-class Home for the Curative Treatment of Nervous Affections. Voluntary Boarders are also received without certificates.

For full particulars apply to the Misses MCLINTOCK, or to Dr. S. BARTON, 34, Surrey-street, Norwich, Visiting Physician.

Grove House, All Stretton, Church STRETTON, SHROPSHIRE.

A PRIVATE HOME for the care and treatment of a limited number of Ladies Mentally Afflicted.

Climate healthy and bracing.

Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

Almina Countess of Carnarvon, has re-opened her Nursing Home, Alfred House, 7, Portland-place, which has been closed during the past six weeks for renovation and repair.

Royal Waterloo Hospital for CHILDREN AND WOMEN, Waterloo-road, S.E.1.

There is a vacancy for an HONORARY CLINICAL ASSISTANT (Male or Female) for an L.C.C. Clinic for children suffering from rheumatic fever and chorea. Candidates should be interested in children's diseases and cardiology. Previous children's experience desirable. The appointment is for six months in the first instance. Applications, accompanied by testimonials, should be sent to the undersigned, of whom further particulars can be obtained, not later than 30th September, 1930.

J. H. TEASDALE, Secretary.

National Hospital, Queen Square, W.C. 1.

RESIDENT MEDICAL OFFICER.—The Board of Management invite applications for the post of Resident Medical Officer, which should be sent to the undersigned, accompanied by copies of three recent testimonials, not later than Monday, September 22nd. The salary is £200 per annum, with board and lodging. Applicants should state if they are willing to accept the appointment of House Physician (salary £150, board and lodging). GODFREY H. HAMILTON, Secretary.

St. Bartholomew's Hospital.

OFFICE OF ASSISTANT DENTAL SURGEON.

Notice is hereby given that an Assistant Dental Surgeon to this Hospital will be appointed at a Committee of Governors to be held on Thursday, the 13th November, 1930, at 11 o'clock in the forenoon.

Candidates must hold a registrable British Medical qualification as well as a registrable British Dental qualification.

Candidates must lodge twelve copies of their application and testimonials with the undersigned on or before Friday, 10th October, 1930. THOMAS HAYES, Clerk to the Governors.
8th September, 1930.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.2.

—Applications are invited for the post of HONORARY DENTAL SURGEON to Out-patients. One visit per week required. The Council is anxious that all Members of the Hospital Staff should be in full sympathy with the religious work of the Hospital. Applications, with testimonials, should be sent immediately to the Medical Superintendent, Mildmay Mission Hospital, Austin-street, Bethnal Green, E.2

Royal Free Hospital,

Gray's Inn-road, W.C.1.

Applications are invited for the appointment of ASSISTANT PHYSICIAN. Intending candidates (Men or Women), who must be Fellows or Members of the Royal College of Physicians, London, should submit applications, accompanied by copies of three recent testimonials, to the undersigned, on or before 4th October, 1930. REGINALD R. GARRATT, Secretary.

St. John's Hospital, Lewisham.—

Vacancies will occur in the appointments of HOUSE PHYSICIAN, HOUSE SURGEON, and CASUALTY OFFICER on the 1st November next. These appointments are resident and are tenable for six months at a salary of £100 p.a. Applications from duly registered Practitioners should reach the undersigned not later than the morning of October 18th. The Selection Committee will sit on October 21st.

J. C. GILBERT, Secretary-Superintendent.

Princess Louise Kensington Hospital

FOR CHILDREN, North Kensington, W. 10.
(50 Beds.)

HOUSE SURGEON AND CASUALTY OFFICER required for six months from October 1st. The House Surgeon's salary is at the rate of £75 a year; should she at the expiration of three months be appointed Senior Resident (of two) the salary would be at the rate of £100 a year, with board, residence, and laundry in each case. Applications, together with copies of three testimonials, must be submitted on a form to be obtained from the Secretary, Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W. 10. Applications must reach the Secretary not later than first post on Wednesday, September 24th.

The London Lock Hospital,

91, Dean-street, W. 1.

Vacancies exist for two HOUSE SURGEONS at the MALE LOCK HOSPITAL.

The Board of Management invite applications from candidates, who must be doubly qualified and duly registered. The appointments are at the rate of £200 per annum, with furnished rooms, full board, and laundry. The appointments are for six months. Duties to commence October 5th, 1930.

Applications, enclosing copies (only) of three recent testimonials, to be sent to the undersigned at the Male Lock Hospital, 91, Dean-street, W. 1, on or before September 26th, 1930.

By order of the Board.

September 9th, 1930. HY. J. EASON, Secretary.

Royal London Ophthalmic Hospital

(Moorfields Eye Hospital), City-road, E.C.1.

Applications are invited for the office of SENIOR RESIDENT OFFICER.

Candidates must be registered Medical Practitioners and must be prepared to begin duties on 1st November, 1930.

Salary at the rate of £150 a year, with board and residence in the Hospital. Additional income will accrue to this post, the care of private patients being included in the duties.

In the event of the First House Surgeon being appointed, other candidates are requested to state whether they would accept the office of First House Surgeon at the rate of £150 a year, Second House Surgeon at the rate of £125 a year, or Third House Surgeon at the rate of £100 a year. The appointments are for a period of six months.

Applications, with testimonials, stating age and qualifications, must be received not later than 3rd October, 1930.

A. J. M. TARRANT, Secretary.

The Hospital for Sick Children,

Great Ormond-street, London, W.C.1.

A HOUSE SURGEON and a HOUSE PHYSICIAN are required on the 14th October, 1930.

Gentlemen are invited to send in their applications, addressed to the Secretary, before 12 o'clock, on Monday, 6th October, 1930, with copies of not more than three testimonials given specially for the purpose, and also evidence of their having held a responsible Hospital appointment.

The appointments are made for six months. Salaries at the rate of £100 per annum, laundry allowance £5, board and residence in the Hospital.

Candidates must be unmarried and possess a legal qualification to practise.

All candidates must be in attendance to appear before the Joint Committee, if required, at their meeting on Wednesday, 8th October, 1930, at 4.45 p.m. precisely.

Forms of application and copies of the Rules may be obtained from the Secretary.

By order of the Board of Management.

September, 1930. JAMES MCKAY, Secretary.

East Ham Memorial Hospital.

(100 beds), Shrewsbury-road, London, E. 7.

Applications are invited for the post of HOUSE SURGEON to Special Departments and Casualty Officer, for six months commencing 15th September, 1930. Salary at the rate of £120 per annum, with board, residence, and laundry. Applications, stating age, experience, and full particulars together with copies of testimonials, should be forwarded to the undersigned as soon as possible. REGINALD PERRY, Secretary.

East Ham Memorial Hospital.

(100 beds), Shrewsbury-road, London, E. 7.

Applications are invited for the post of HOUSE PHYSICIAN for six months, commencing 15th September, 1930. Salary at the rate of £150 per annum, with board, residence, and laundry. Applications, stating age, experience, and full particulars, together with copies of testimonials, should be forwarded to the undersigned as soon as possible.

REGINALD PERRY, Secretary.

East Ham Memorial Hospital.

(100 beds), Shrewsbury-road, London, E. 7.

Applications are invited for the post of RESIDENT MEDICAL OFFICER for six months, commencing 1st October, 1930. Salary at the rate of £200 per annum, with board, residence, and laundry. Preference will be given to candidates who hold the diploma of F.R.C.S. Applications, stating age, experience, and full particulars, together with copies of testimonials, should reach the undersigned as soon as possible.

REGINALD PERRY, Secretary.

County of London.

The London County Council invites applications for appointment as EIGHTH ASSISTANT MEDICAL OFFICER (Man) in the mental hospital service. Candidates must be under thirty-five years of age, and be registered to practise both in medicine and surgery in England. Salary £445 a year, rising by annual increments of £25 to £570 a year. No emoluments. Charges for board, lodging, &c. (at present £2 9s. a week) if required to be resident. Candidates appointed will be pensionable under the Asylums Officers' Superannuation Act, 1909. Form of application giving full particulars can be obtained from the Chief Officer, Mental Hospitals Department, The County Hall, Westminster Bridge, S.E.1. Applications must be received by Thursday, 2nd October, 1930. Canvassing disqualifies.

MONTAGUE H. COX, Clerk of the London County Council.

The County Hall, S.E.1.

The Prince of Wales's General

HOSPITAL, Tottenham, N.15.

The following Resident posts will be vacant on the 1st November, next:—

SENIOR HOUSE PHYSICIAN; SENIOR HOUSE SURGEON and SPECIAL HOUSE SURGEON. Salaries at the rate of £120 per annum.

JUNIOR HOUSE PHYSICIAN and TWO JUNIOR HOUSE SURGEONS. Salaries at the rate of £90 per annum. Board, residence and laundry.

Appointment held for six months, but holders are eligible for re-appointment for a further term.

Candidates (male) must be fully qualified and registered, and applications (on the prescribed form) together with copies of three recent testimonials, should be sent to me on or before the first post on Wednesday, October 1st, next.

September 15th, 1930. J. C. BURDETT, Director.

West London Hospital (234 Beds),

[Hammersmith, W. 6.

Applications are invited for the post of HONORARY OPHTHALMIC SURGEON for which the present Honorary Assistant Ophthalmic Surgeon is a candidate. In the event of his election, there will be a vacancy for an Honorary Assistant Ophthalmic Surgeon, for which applications are also invited.

Candidates must be Fellows of one of the Royal Colleges of Surgeons of England, Edinburgh or Ireland. The successful candidate will be required, in addition to his other duties, to undertake such teaching for the Post Graduate College as the Board may approve.

Applications, with copies only of testimonials, must reach me not later than Thursday, 23rd October. Candidates must attend the Meeting of the Medical Council on Friday, 24th October, at 4·30 P.M., and prior to that date call upon, and send copies of application and testimonials to each member thereof. They must not canvass members of the Board of Management, but nevertheless must send copies of their application and testimonials to each member thereof, and, if so notified, be in attendance at a Meeting of the Board at 5 P.M., on Tuesday, 28th October, when the election will be made.

H. A. MADGE, Secretary.

South London Hospital for Women,
Clapham Common, S.W. 4.

The Board of Management invite applications from qualified Medical Women for the appointment of CLINICAL ASSISTANT to Surgical Out-patients (mainly Gynæcological cases) to attend on Tuesday mornings. Applications, with testimonials, to be forwarded to the Secretary at the Hospital.

Western General Dispensary,
Marylebone-road, London, N.W. 1.

There is a vacancy in the post of HONORARY OPHTHALMIC SURGEON to this Dispensary.

Applicants, who must be either a Fellow or Member of the Royal College of Surgeons are invited to send in their applications together with copies of testimonials to the Hon. Secretary on or before Thursday, October 2nd, 1930.

The Weir Hospital, Grove-road,
Balham, S.W.12.

SENIOR RESIDENT MEDICAL OFFICER (Male, unmarried) required at the end of October. Candidates must be fully qualified and duly registered. Salary £200 per annum, with board, residence and laundry.

Applications, with copies of testimonials, to be sent to the Secretary, from whom further information may be obtained.

London Hospital, E.1.

There is a vacancy for the post of ASSISTANT SURGEON. Candidates must be Fellows of the Royal College of Surgeons, England.

Applications should be sent to the House Governor and must arrive not later than on Saturday, October 18th.

September 15th, 1930. A. G. ELLIOTT, House Governor.

Golden Square Throat, Nose and Ear
HOSPITAL, London, W. 1.

Applications are invited for the following honorary posts:—

1. REGISTRAR.
2. CLINICAL ASSISTANT.

Particulars of the duties may be obtained from the undersigned. F. P. CARROLL, Secretary-Superintendent.

12th September, 1930.

Queen Charlotte's Maternity Hospital
Marylebone-road, N.W. 1.

TWO RESIDENT ANÆSTHETISTS required to commence duty on 1st October. Applicants must be registered. Appointment for six months. Salary at the rate of £80 per annum each, with board, residence, and washing allowance (4s. weekly). Copies (not originals) of not more than three testimonials will be received by the Secretary up to 29th September.

ARTHUR WATTS, Secretary.

City of London Hospital for Diseases
OF THE HEART AND LUNGS, Victoria Park, E. 2.
(Bus, Tram, and Rail, Cambridge Heath, L. & N.E. Railway.)

A vacancy for a HOUSE PHYSICIAN (Male) will occur on 1st November, 1930. Six months' appointment. Salary at the rate of £100 per annum. Board, residence, and laundry provided.

Applications, with copies of (three) testimonials, should be sent to the undersigned on or before Friday, 17th October.

GEORGE WATTS, Secretary.

Central London Throat, Nose and
EAR HOSPITAL, Gray's Inn-road, W.C. 1.

ASSISTANTS IN THE OUT-PATIENT DEPARTMENT.

There are vacancies for two Assistants in the Out-patient Department.

Assistants are graded 1st, 2nd, and 3rd according to experience in the specialty and length of service at the Hospital.

The posts are honorary, tenable for one year subject to re-election. Attendance is required at one or two Clinics each week to assist the Surgeons in seeing the patients; vacancies at present on Wednesday, Thursday, and Friday at 2 P.M. each day.

Applications should be sent to the undersigned immediately.

JOHN H. YOUNG, Secretary-Superintendent.

Evelina Hospital for Children,
Southwark, S.E.—The Committee of Management requires a HOUSE SURGEON (Male) for four months from 12th October. Salary at £120 per annum, with board and residence. Candidates (duly registered) to send applications, giving age and qualifications (with dates), and copies of four testimonials, to the undersigned at the Hospital before 1st October.

Applicants will be informed if they will be interviewed by the Medical Committee. Selected candidates must attend Committee of Management. Time and place of Meeting will be notified by the undersigned, from whom rules and other particulars relating to the post must be obtained.

By order of the Committee of Management.
H. C. S. SMITH,
15th September, 1930. Secretary-Superintendent.

The Hospital for Epilepsy and
PARALYSIS, Maida Vale, W. 9.

HONORARY DENTAL SURGEON REQUIRED.

Applications are invited for the post of Honorary Dental Surgeon. Applications, with copies of not more than three recent testimonials, should reach me by 4th October.

H. W. BURLEIGH, Secretary and General Superintendent.

Western Ophthalmic Hospital,
Marylebone-road, London, N.W. 1.

SENIOR HOUSE SURGEON (Resident) required November 1st.
JUNIOR HOUSE SURGEON (Non-resident) required November 1st.

Applications are invited for the above posts. The salaries are at the rate of £150 and £100 per annum respectively, and the appointments are for six months. Previous ophthalmic experience is required. Applications, accompanied by copies of three testimonials, should reach me by October 1st. Candidates should be prepared to attend before the Medical Committee on Friday, October 3rd, at 5 P.M. Applicants for the Senior Post should state if they are prepared to accept the Junior Post.

H. W. BURLEIGH, Honorary Secretary.

St. Mary's Hospital for Women and
CHILDREN, Plaistow, E. 13. (71 Beds.)

Applications are invited for the posts of RESIDENT and ASSISTANT RESIDENT MEDICAL OFFICERS (vacant 1st November), Male or Female. The appointments are for six months. Board and residence provided. Salaries at the rate of £175 and £120 per annum respectively, and £5 extra allowed for personal laundry.

The duties of the R.M.O. are mainly surgical, and those of the A.R.M.O. mainly medical. Personal canvassing not desired. Applications, with copies of three recent testimonials, to be sent to the undersigned not later than 30th September.

A. ERNEST WILKES, Secretary.

South London Hospital for Women,
South Side, Clapham Common, S.W. 4.

The Board of Management invite applications from fully qualified Medical Women for the undermentioned appointments

HOUSE PHYSICIAN,
HOUSE SURGEON,

each for a period of six months from November 1st. Salary at the rate of £50 per annum, with board, residence, and laundry. Candidates are expected to call upon Members of the Honorary Medical Staff. Particulars to be obtained from the Secretary before Monday, October 6th, by which date applications and copies of testimonials must reach the Secretary at the Hospital.

Administrative County of London.

HOSPITALS SERVICE.

The London County Council invites applications from duly qualified medical practitioners for appointment to positions at the undermentioned hospitals. Candidates must have had previous residential hospital experience. The persons appointed will be required to carry out such duties as may be assigned by the medical superintendent, and, should occasion arise, to assist at any of the other establishments or medical districts under the control of the London County Council.

(*a*) ARCHWAY HOSPITAL, Archway-road, Highgate, N.
ASSISTANT MEDICAL OFFICER. Salary £300 a year, with board, lodging, and laundry. The appointment will be for one year only in the first instance. No quarters are available for a married man, and the accommodation will be only for the person appointed (man or woman).

(*b*) HACKNEY HOSPITAL, High-street, Homerton, E. 9.
ASSISTANT MEDICAL OFFICER. Salary £350 a year, with board, lodging, and laundry. The duties are mainly in the out-patient department of the hospital, and candidates must have held a residential surgical appointment. The appointment will be for one year only in the first instance. There is accommodation only for the person appointed (man or woman). There are no quarters for a married man.

(*c*) ST. PETER'S HOSPITAL, 74, Vallance-road, E. 1.
ASSISTANT MEDICAL OFFICER. Salary £450 a year, with board, lodging, and laundry. Candidates should have had experience in the administration of anæsthetics and post-graduate experience in obstetrics. The person appointed will be required to assist the medical superintendent with the outdoor medical work of the district. No quarters are available for a married man or for a woman medical officer.

The salaries and conditions of appointment in each case are provisional and are subject to review by the Council.

Forms of application may be obtained from the Medical Officer of Health (Staff Division), The County Hall, Westminster Bridge, S.E. 1. A stamped addressed foolscap envelope should be enclosed and forms must be returned by 26th September, 1930. Canvassing disqualifies. Candidates desiring to apply for more than one appointment must send in a separate form of application in respect of each hospital. Inquiries for further details as to the nature and scope of the duties at the individual hospitals should be addressed to the Medical Superintendent of the Hospital concerned.

MONTAGU H. COX, Clerk of the London County Council
The County Hall, S.E. 1.

The Willesden General Hospital.
(Incorporated), N.W. 10.

Applications are invited for the following appointments:—
(*a*) CLINICAL ASSISTANT TO THE EAR, NOSE, AND THROAT (OUT-PATIENT) DEPARTMENT.
(*b*) CLINICAL ASSISTANT TO THE MEDICAL OUT-PATIENT DEPARTMENT.

The Ear, Nose, and Throat Department session is held on Wednesday afternoons; the Medical Department session on Tuesday afternoons.

Applications should be addressed to the Secretary of the Hospital not later than Monday, 29th September, 1930.

15th September, 1930.

Dickinson Scholarships.

The Trustees invite applications, on or before 30th September, for a Scholarship in CLINICAL MEDICINE of the value of £150 for one year. For particulars apply to the undersigned.

FRANK G. HAZELL, Secretary.
Manchester Royal Infirmary.

The Royal United Hospital, Bath.

HOUSE SURGEON (Male), British nationality, required. Salary £200 per annum, with board, residence, and laundry. The appointment is for a minimum period of six months.

Applications, stating age, qualifications, experience, together with three recent testimonials, to be forwarded at once to the undersigned.

J. LAWRENCE MEARS, Secretary-Superintendent.

16th September, 1930.

Manchester and Salford Hospital for SKIN DISEASES.

HOUSE SURGEON.

Applications are invited for the post of House Surgeon. Must be registered. The appointment is for twelve months from October 1st. Salary £100 per annum, with board and residence.

Applications, with copies of three testimonials, to be sent to the undersigned, Quay-street, Manchester.

JOHN NALL, Secretary.

Chesterfield and North Derbyshire ROYAL HOSPITAL. (190 Surgical and Medical Beds.)

HOUSE SURGEON.

Applications are invited from fully qualified Men for the above post.

The appointment is for six months.

Salary is from £100 to £175 per annum, according to experience, with board, apartments, and laundry.

Applications, stating age, together with copies of three recent testimonials, should be sent to the undersigned.

G. SUNNUCK, Superintendent and Secretary.

26th August, 1930.

Hertfordshire County Council.
WARE PARK SANATORIUM.

ASSISTANT MEDICAL OFFICER.

Applications are invited for the appointment of Assistant Medical Officer of the County Sanatorium, Ware Park, near Ware. Age not less than twenty-five or more than forty years. Applicants must not be married men, and should be qualified medical practitioners with hospital experience, and preference will be given to those who have had experience of the institutional treatment of tuberculosis. The appointment is for one year. Salary £300 per annum, with furnished rooms rent free, together with board, washing, light, fuel, and service.

Forms of application, with particulars, can be obtained from the Clerk of the County Council, Clerk of the Peace Office, Hertford, and must be returned duly completed before the 30th September, 1930.

ELTON LONGMORE,
Clerk of the Hertfordshire County Council.

Clerk of the Peace Office, Hertford, September, 1930.

Rowley Regis Urban District Council

ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER.
(Temporary, half-time.)

Applications are invited for the above post, the duration of which will not exceed one year. The salary will be at the rate of £300 per annum, with travelling expenses within the Urban District. The duties will be carried out under the supervision of the Council's Medical Officer of Health (who is also School Medical Officer), and in his absence, of the Deputy Medical Officer. Candidates should have had three years' experience since qualification, and special experience in diseases of children will be a recommendation. The appointment will be subject to approval by the Ministry of Health and Board of Education. The candidate will be required every afternoon, except Saturday, from 2 to 5 P.M., and one morning in alternate weeks. Applications, with particulars of qualifications, to be addressed to "The Clerk, Council House, Old Hill, Staffordshire," not later than 2nd October, 1930.

Lingfield Epileptic Colony, Surrey.

Wanted, ASSISTANT MEDICAL OFFICER (Lady preferred). Commencing salary £225, resident, or more according to experience. Apply to the Medical Superintendent.

King George Hospital, Ilford

(8 miles from London) (80 Beds).—Applications are invited for the appointment of HOUSE OFFICER. Salary £100 per annum, with board, residence, &c. Applications should be sent at once to the Secretary.

King George Hospital, Ilford

(8 miles from London) (80 Beds).—Applications are invited for the appointment of RESIDENT MEDICAL OFFICER. Salary £250 per annum, with board, residence, &c. Term, twelve months with eligibility for further period. Previous Hospital experience essential. Preference given to candidates who are Fellows of a Royal College of Surgeons. Applications should be sent to the Secretary immediately.

Swansea Hospital (316 Beds).

HOUSE SURGEON wanted, Gentleman, single. Salary £150. per annum, with board, residence, and laundry.

Applications, stating age, nationality, qualifications, and experience, together with copies of three recent testimonials, to be forwarded to the undersigned.

O. C. HOWELLS, Secretary.

The Mount Vernon Hospital, Northwood, Middlesex.

There is a vacancy for a HOUSE SURGEON (Male). Candidates must be fully qualified and registered. Salary £200 per annum, with board, lodging, and laundry.

Applications, with three copies of testimonials, should be sent to W. J. MORTON, Secretary.

7, Fitzroy-square, W.1.

Royal South Hants and Southampton HOSPITAL, Southampton.

ASSISTANT HOUSE SURGEON required, to commence duties at once. Six months' engagement. Salary £180 per annum, with rooms, board, and laundry. Applications, stating age, to be sent to the undersigned, together with copies of testimonials (limited to five), as soon as possible.

HY. TRUSSON, Secretary.

Ancoats Hospital, Manchester.

HOUSE SURGEON (Male) required to commence duty on 1st October next for a period of six months. Salary at the rate of £100 per annum, with board, apartments, &c.

Applications, stating age, qualifications, experience, if any, to be forwarded to the undersigned on or before 24th September next. By order of the Board.

HERBERT J. DAFFORNE,
General Superintendent and Secretary.

Herefordshire General Hospital, Hereford.

Applications are invited for the post of HOUSE PHYSICIAN (Male), six months' appointment, renewable. Salary £150 per annum, with board, residence, and laundry.

Candidates must be fully qualified and registered. Applications, stating age, qualifications, and experience, together with not more than three copies of recent testimonials, should reach the undersigned not later than the 4th October, 1930.

H. A. FROGGATT, Secretary.

Royal Sussex County Hospital, Brighton (237 Beds).

CASUALTY HOUSE SURGEON (Male) required immediately. Salary £120 per annum, with board, residence, and laundry. Candidates must hold Medical and Surgical qualifications of the British Empire, and be duly registered under the Medical Acts. They must be unmarried, and when elected under thirty years of age.

Applications, with copies of recent testimonials, should be sent to the undersigned.

L. L. W. LANCASTER-GAYE, Secretary-Superintendent.

Preston and County of Lancaster ROYAL INFIRMARY.

Applications are invited for the following posts:—
HOUSE SURGEON (under Consulting Surgeon).
HOUSE PHYSICIAN (to take charge of Medical, and Eye, Ear, &c., Wards).

Salary in each case £150 per annum, with board, residence, and laundry.

Applications, stating age, nationality, qualifications, and experience, together with copy testimonials, to be addressed immediately to JOHN GIBSON, Superintendent and Secretary, Royal Infirmary, Preston.

East Suffolk and Ipswich Hospital,
Ipswich. (265 Beds—7 Residents.)

Applications are invited for the posts of:—

CASUALTY OFFICER. Salary £150 per annum. Board, residence, and laundry. Previous experience essential.

HOUSE SURGEON. Salary at the rate of £120 per annum. Six months' contract, with board, residence, and laundry.

Applications from British (Male) candidates, stating age, qualifications, and experience, and accompanied by three recent testimonials, to be sent to the undersigned.

ARTHUR GRIFFITHS, Secretary.

The Hospital, Ipswich, 18th August, 1930.

Manchester Babies' Hospital, Burnage-
lane, Levenshulme.—Applications are invited for the post of JUNIOR RESIDENT MEDICAL OFFICER. Appointment is for six months from November 1st, 1930. Salary at the rate of £50 per annum, with laundry.

Applications, together with copies of testimonials, should be sent to the undersigned and marked "J.R.M.O.," by Monday, October 6th. ANGELA LOPEZ, Secretary.

Royal United Hospital, Bath.

Wanted at once, a HOUSE SURGEON. Salary £150 per annum.

The appointment will be for not less than six months, and candidates must be Male, unmarried, and of British nationality.

Applications, with three recent testimonials, must be addressed to the undersigned.

J. LAWRENCE MEARS, Secretary-Superintendent.

North Devon Infirmary, Barnstaple.
(70 Beds.)

Wanted at once, duly qualified RESIDENT MEDICAL OFFICER (Gentleman or Lady). Salary £150 per annum, with board, apartments, and laundry. Appointment to be for not less than six months. Applications, stating age, qualifications, with copies of recent testimonials, to be sent forthwith to the Hon. Secretary.

Royal Berkshire Hospital (243 beds).

Wanted, CASUALTY OFFICER AND RESIDENT ANÆSTHETIST. Candidates must be fully qualified and registered; the appointments are for six months, and the salaries are at the rate of £150 per annum, with board, residence, and laundry.

Applications, with copies of testimonials, should be addressed to the undersigned. HERMAN BURNEY, Secretary.

Reading, 13th September, 1930.

Oldham Royal Infirmary.

Two HOUSE SURGEONS required immediately, one for Male Wards and one for Out-patients and Special Departments. Appointments tenable until 31st December, 1930.

Successful applicants will be eligible for re-appointment. Salary at the rate of £175 per annum, with board, residence, and laundry. Applications to be submitted forthwith, together with copies of three recent testimonials, to the undersigned.

CHARLES D. DRAKE, General Superintendent.

Great Yarmouth General Hospital.
(72 Beds.)

Required to commence duties immediately, a SENIOR and JUNIOR HOUSE SURGEON.

Salaries at the rate of £150 and £140 per annum, respectively, together with board, residence, and laundry.

Applications, together with copies of three recent testimonials, to be submitted to the undersigned.

FRANK JENNINGS, Secretary.

Merthyr General Hospital,
Merthyr Tydfil.

Applications are invited for the post of RESIDENT HOUSE SURGEON at this Hospital (104 Beds) for a period of six months, Salary at the rate of £150 per annum, with board, rooms, and laundry.

Applicants must have had experience in administration of anæsthetics.

Applications, stating age and qualifications, and enclosing copies (only) of not more than three testimonials, should be addressed Hon. Secretary, Hon. Medical Staff, Merthyr General Hospital.

The Gloucestershire Royal Infirmary
AND EYE INSTITUTION, Gloucester. (153 Beds.)

Applications are invited for the post of SECOND HOUSE SURGEON (Male). Salary £120 per annum, with board, residence, and laundry. (Four resident medical officers.)

The appointment is for six months, which may be extended for similar periods by re-election from time to time.

Applications, stating age, qualifications, and nationality, with copies of not less than three recent testimonials, must be received by the undersigned not later than Wednesday, September 24th. The elected candidate will be required to enter upon his duties on Wednesday, October 8th.

August 21st, 1930. F. J. SYMONS, Secretary.

City of Bradford.

Applications are invited from duly-qualified Medical Men with experience in Clinical Pathology and Bacteriology for vacancies on the staff of the CITY PATHOLOGIST and BACTERIOLOGIST. The commencing salaries will not be less than £600 per annum.

The appointments will be subject to the provisions of the Local Government and Other Officers' Superannuation Act, 1922, and the successful candidates will be required to pass a satisfactory medical examination.

Forms of application may be obtained from the Medical Officer of Health, Town Hall, Bradford, and should be returned to him not later than the 29th September, 1930.

N. L. FLEMING, Town Clerk.

Town Hall, Bradford, 8th September, 1930.

County Borough of Walsall.

MANOR HOSPITAL.

RESIDENT ASSISTANT MEDICAL OFFICER.

Applications are invited from duly qualified gentlemen for the appointment of First Assistant Resident Medical Officer. The salary will be at the rate of £200 per annum, together with the usual residential emoluments. The appointment will be tenable for a period of twelve months.

The person appointed will be required to act under the general direction of the Medical Officer, from whom particulars of the appointment may be obtained.

Applications, stating age, professional qualifications, and experience, accompanied by not more than three copies of recent testimonials, should be sent to the undersigned at once.

C. S. FOTHERGILL, Public Assistance Officer.

29, Leicester-street, Walsall, 25th August, 1930.

The Royal Portsmouth Hospital.
(Five Resident Medical Officers.)

Applications are invited for the posts of:—

SENIOR HOUSE SURGEON (Male). Salary at the rate of £175 per annum, with board, &c. Candidates must have held an appointment as House Surgeon at a General Hospital as the post is a very responsible one.

HOUSE PHYSICIAN (Male). Salary at the rate of £130 per annum.

HOUSE SURGEONS (Two, Male). Salary at the rate of £130 per annum each.

CASUALTY OFFICER (Male). Salary at the rate of £100 per annum.

All Officers must be qualified and will be required to commence on 1st October, 1930 (six months' appointments and eligible on completion of term for extension or other resident posts).

Applications, stating age, nationality, and full details, with copies of three testimonials, to be sent to the undersigned as soon as possible, from whom all particluars can be obtained.

B. WAGSTAFF, Secretary.

City of Plymouth.

RESIDENT MEDICAL OFFICER.

Applications are invited from duly qualified and registered Medical Practitioners for the post of Resident Medical Officer at the City Hospital, Plymouth.

The person appointed will work under the control of the Medical Superintendent, and will be an assistant to the Medical Officer of Health. Preference will be given to candidates who have had previous experience as House Surgeons or House Physicians.

The salary will be at the rate of £350 per annum, and quarters, food, &c., will be provided. The appointment is terminable by three months' notice on either side.

Forms of application will not be provided, but applicants should state their age, their previous experience, and present appointment. Canvassing will disqualify.

Applications, endorsed "Resident Medical Officer," together with copies of three recent testimonials, must be received by the undersigned by Tuesday, 30th September, 1930.

A. T. NANKIVELL, M.D., M.R.C.P., D.P.H.,
Medical Officer of Health.

Town Hall, Stonehouse, Plymouth, 4th September, 1930.

APPOINTMENT OF A REGISTERED MEDICAL MAN OR WOMAN AS A RESEARCH WORKER IN MENTAL DEFICIENCY.

RE-ADVERTISED AT AN INCREASED SALARY.

The Medical Research Council, the
Governing Body of the Darwin Trust, and the Committee of the ROYAL EASTERN COUNTIES' INSTITUTION for the MENTALLY DEFECTIVE at Colchester jointly invite applications from registered Medical Men or Women to undertake research into Mental Deficiency.

The person appointed will be a Member of the Medical Staff of the Royal Eastern Counties' Institution, and will be expected to take some part in the Administrative and Clinical work of the Institution itself, but the major part of the work will be an investigation into the causes of mental deficiency from the clinical, social, and genetic aspects. A Social Investigator will be appointed to assist in the work.

Commencing salary at the rate of £750 a year, non-resident.

A form of application can be obtained from the Medical Superintendent, Royal Institution, Colchester, which must be completed and returned before the 4th October. Duties to commence 1st January, 1931.

The New Dewsbury and District

GENERAL INFIRMARY.—Applications are invited for the post of SECOND HOUSE SURGEON; one with Orthopædic experience preferred.

Salary £150, with board, residence, and laundry.

Applications, stating age and experience, together with copies of recent testimonials, to be sent immediately to the undersigned.

H. G. PRICE, Secretary-Superintendent.

South Devon and East Cornwall

HOSPITAL, Plymouth. (240 Beds.)

HOUSE SURGEON. Salary £100 per annum, with board, residence, and laundry. Appointment is tenable for six months, and is subject to renewal. Duties to commence at once.

Candidates must be registered under the Medical Acts.

Applications, stating age and qualifications, together with copies of recent testimonials, to reach the undersigned by 30th September.

ARTHUR R. CASH,
General Superintendent and Secretary.

13th September, 1930.

Royal Buckinghamshire County

HOSPITAL, Aylesbury. (78 Beds.)

Applications are invited for the office of HONORARY CONSULTING SURGEON to the THROAT, NOSE AND EAR DEPARTMENT from gentlemen who are Fellows of the Royal College of Surgeons of England, Edinburgh, or Ireland.

The appointment is now vacant, and the selected candidate will be required to attend the Hospital one afternoon weekly or fortnightly for the usual duties of this appointment.

Applications should be sent to the Secretary, from whom further particulars regarding the appointment may be obtained.

By order of the Board of Management.

M. W. BROWN, Secretary.

The Royal Devon and Exeter Hospital,

Exeter. (225 Beds.)

HOUSE SURGEON TO SPECIAL DEPARTMENTS.

Applications are invited for the post of House Surgeon to the Ear, Throat, and Nose, X-Ray and Casualty Departments at this Hospital shortly becoming vacant. The appointment is for six months, and candidates are eligible for re-election.

Salary at the rate of £150 per annum, with board, apartments, and washing.

Applications, giving particulars as to age and qualifications together with copies of recent testimonials, should be sent to the undersigned as soon as possible.

By order of the Committee.

12th Sept. 1930. S. S. COLE, Secretary and Manager.

City of Leicester Education Committee.

APPOINTMENT OF AN ASSISTANT SCHOOL MEDICAL OFFICER (Male).

The Education Committee invite applications for the post of Assistant School Medical Officer (Male) to carry out duties connected with the medical inspection of school children in the City of Leicester, under the direction of the School Medical Officer.

The person appointed will be required to devote his whole time to the duties of the Office.

Salary according to scale—viz.: minimum £500 per annum, increasing by annual increments of £25 to maximum of £700. If the Officer appointed has served previously under a Local Authority, such service will be taken into account in determining his commencing salary.

Application (by letter and accompanied by copies of not more than three recent testimonials) should be forwarded to the undersigned not later than Tuesday, the 30th September.

F. P. ARMITAGE, Director of Education.

Town Hall, Leicester, 15th September, 1930.

Administrative County of Essex.

MALE ASSISTANT
COUNTY MEDICAL OFFICER OF HEALTH.

The County Council of the Administrative County of Essex invite applications for the above post from registered Medical Practitioners specially qualified in the treatment of Tuberculosis, School Medical Inspection, and Maternity and Child Welfare, holding a Diploma of Public Health, and not over forty-five years of age.

Preference will be given to candidates who have had at least three years' experience in Public Health work subsequent to their medical qualification. The salary attached to the appointment will be from £500 to £700 per annum, according to experience, and an allowance for travelling will be made. The person appointed will be required to devote his whole time to the service of the Council, and to perform such duties and to furnish such advice and assistance appertaining to his office as may be required, and to reside in such district of the County as the Council may decide. The appointment will be subject to three months' notice on either side.

Applications, on the prescribed form obtainable from the undersigned, and accompanied by copies of not more than three testimonials, which will not be returned, should be addressed to me and delivered at the Shire Hall, Chelmsford, not later than 10 a.m. on Monday the 29th day of September, 1930.

JOHN H. GOOLD, Clerk of the County Council.

Shire Hall, Chelmsford, 8th September, 1930.

Ear and Throat Hospital,

Edmund-street, Birmingham.

RESIDENT ANÆSTHETIST (experienced) wanted, with occasional other duties. Appointment for six months, and eligible for re-election. Salary at the rate of £150 per annum, with board and laundry. Duties to commence 1st October. Applications and testimonials to be forwarded on or before 23rd September, 1930, to the undersigned.

September, 1930. S. G. GREW, Secretary.

Cheshire Joint Sanatorium, Market

Drayton, Salop.—HOUSE PHYSICIAN required (Male). The appointment will be for twelve months. Inclusive salary £250 per annum, with board, residence, and laundry. Applications to be made on forms, obtainable from the Medical Superintendent, which should be returned, with copies of three recent testimonials, not later than Wednesday, September 24th.

Leicestershire and Rutland Mental

HOSPITAL, Narborough, near Leicester.

A LOCUM TENENS MEDICAL OFFICER is required at the above Hospital for three months, commencing October 1st next. Salary 7 guineas per week, with apartments, board, and attendance.

Applications to be addressed to the Medical Superintendent.

Kent County Ophthalmic and Aural

HOSPITAL, Maidstone. (105 Beds.)

The Board of Management invite applications for the post of HONORARY OPHTHALMIC SURGEON. Full particulars may be had upon request to the undersigned, to whom applications should be sent not later than Friday, the 17th October, 1930.

JOHN W. STRICKLAND, Secretary.

Essex County Hospital, Colchester.

(160 Beds).

Wanted in October, a HOUSE PHYSICIAN (Male). Salary £150 per annum, with board, washing, and residence in the Hospital. Medical and Surgical qualifications required.

Applications with three recent testimonials, to be sent on or before Thursday, the 24th September, to

ALFRED G. BUCK, Secretary.

Royal Isle of Wight County Hospital,

Ryde.

RESIDENT HOUSE SURGEON wanted for October 1st, 1930, either sex, unmarried. Doubly qualified and registered. State age and nationality. Salary at the rate of £180 yearly, with board, residence, and laundry. Apply, enclosing copies of testimonials to Secretary, before Saturday, September 27th, 1930. Return railway fare for selected candidates.

A. S. GORDON, Secretary.

Durham County and Sunderland

EYE INFIRMARY.

Wanted, Two OPHTHALMIC SURGEONS for the above Institution, to attend during the forenoon on three alternate days per week and one afternoon clinic per week. Commencing salary £350 per annum. Applications, with copies of recent testimonials, to be sent to JOHN BUTTERFIELD, Secretary, Eye Infirmary, Stockton-road, Sunderland.

Staffordshire General Infirmary,

Stafford.

HOUSE SURGEON, male or female required immediately. Salary at the rate of £200, with board, residence, and laundry. Candidates must be duly qualified and registered under the Medical Acts. The appointment to be held for at least six months. Applications, stating age, accompanied by copies of three recent testimonials, should be sent at once to the undersigned.

A. E. COLLINS, Secretary.

Stafford, 13th September, 1930.

Besford Court Catholic Mental

WELFARE HOSPITAL FOR CHILDREN.

RESIDENT MEDICAL REGISTRAR wanted at once for a period of six months to a year.

Honorarium at the rate of £150 per annum, with first-class board. The Institution contains 250 high-grade mentally defective boys, and offers a unique opportunity for experience and research in psychological medicine and endocrinology.

Full particulars on application to

The Administrator, Besford Court, Worcester.

The Sheffield Royal Hospital.

Required, OPHTHALMIC HOUSE SURGEON for 1st October and a HOUSE SURGEON for the 1st November (Males). Salary for the first six months at the rate of £80 per annum, after which £100 per annum, with board, residence, and laundry. There are twelve Resident Medical Officers.

Applications should be forwarded at once to

W. H. BOOTH, Superintendent and Secretary.

Hertford County Hospital.

Applications are invited for the post of RESIDENT SURGICAL OFFICER. Salary £250 per annum, with board, residence, and laundry.

For preference candidates should hold the Fellowship of the Royal College of Surgeons.

The appointment is for six months in the first instance.

Applications, with copies of three recent testimonials should be sent to the undersigned and be received not later than Tuesday 23rd, September, 1930.

PERCY G. BROOKS, Secretary.

County Council of the West Riding
OF YORKSHIRE.

MIDDLETON-IN-WHARFEDALE SANATORIUM.

The County Council of the West Riding of Yorkshire invite applications for the appointment of JUNIOR RESIDENT MEDICAL OFFICER at the Middleton-in-Wharfedale Sanatorium, near Ilkley (300 beds). The appointment will be for one year. Salary at the rate of £250 per annum, with board, residence, and laundry.

Hospital experience is an advantage.

Applications, together with copies of recent testimonials, should be sent to the County Medical Officer, County Hall, Wakefield, not later than October 6th.

J. CHARLES MCGRATH, Clerk of the County Council.

County Hall, Wakefield.

Salop County Council.

MEDICAL INSPECTION OF SCHOOL-CHILDREN AND MATERNITY AND CHILD WELFARE.

Applications are invited from registered Medical Practitioners (Male) for the post of ASSISTANT MEDICAL OFFICER to work under these schemes. Salary £600 per annum, rising by annual increments of £25 to a maximum of £700, with travelling and out-of-pocket expenses on a fixed scale.

The salary will be subject to a deduction of 5 per cent. for superannuation under the Local Government and Other Officers' Superannuation Act, 1922, and the candidate selected will be required to pass a medical examination.

The candidates must possess a Diploma in Public Health and experience in Refraction Work is desirable but not essential.

Applications should be received on or before Saturday, 4th October, 1930, by the County Medical Officer of Health, College Hill House, Shrewsbury, from whom forms of application, conditions of appointment, list of duties, and any other information can be obtained.

City of Leicester.

RESIDENT MEDICAL OFFICER.

The Health Committee of the City of Leicester invite applications for the position of Resident Medical Officer (Male) at their City General Hospital, for a period of twelve months.

The Hospital is a modern building with 550 beds, and two Resident Medical Officers.

Salary £250 per annum, increasing after six months' approved service to £300 per annum, together with full residential emoluments. The gentleman appointed to the post will be required, when requested, to assist at the Institutions of the Public Assistance Committee.

The successful candidate will be required to pass a medical examination, and to contribute to the Corporation Superannuation Fund.

Further particulars of the appointment may be obtained from the Medical Superintendent, E. C. Hadley, M.D., B.S. Lond., F.R.C.S.E., City General Hospital, Gwendolen-road, Leicester. Applications, stating age, experience, qualifications, and nationality, accompanied by copies of three recent testimonials, should be addressed not later than the 26th September, 1930, to

WILFRID CARR, Secretary, Health Department.

Health Offices, Grey Friars, Leicester, 11th September, 1930.

Monmouthshire County Council.

ASSISTANT MALE MEDICAL OFFICER.

The Council invite applications from duly qualified Medical Men, holding a Diploma in Public Health and State Medicine, for the appointment of Assistant Medical Officer, to undertake mainly the Medical Inspection and Treatment of School Children, and, in addition, Maternity and Child Welfare work and the investigation of sanitary conditions generally.

Experience in the administration of anæsthetics and the correction of errors of refraction will be considered an additional qualification.

Salary £500 per annum, rising by annual increments of £25 to £750, with third-class rail fares and reasonable subsistence allowance.

The successful candidate will be required to act under the direction and supervision of the County Medical Officer, to devote whole time to the service of the County Council, and to reside in such place as the Council may determine.

The post will be subject to the provisions of the Local Government and Other Officers' Superannuation Act, 1922.

A schedule of the duties to be performed, together with conditions of appointment and a form of application, can be obtained from the undersigned, to whom applications, with age of candidate, and accompanied by copies of not more than three recent testimonials, are to be sent by the 1st October, 1930.

D. ROCYN JONES, County Medical Officer.

The County Hall, Newport, Mon., 11th September, 1930.

Medical Practitioner wanted for the
ISLAND OF NORTH RONALDSHAY, Orkney, under the Scottish Board of Health Scheme. Salary £400, house rent and rate free. No outside practice. State nationality by birth.

D. J. ROBERTSON, Solicitor, Kirkwall.

President, North Ronaldshay Medical Association.

Manchester Royal Infirmary.

JUNIOR ASSISTANT MEDICAL OFFICER IN RADIOLOGICAL DEPARTMENT.

The Board of Management of the Manchester Royal Infirmary invite applications for the above appointment. Applicants must be registered and hold a Medical and Surgical qualification.

The appointment (non-resident) is for twelve months, renewable for a further period of twelve months, subject to the provisions of the bye-laws as to notice. Salary is at the rate of £400 per annum. Applicants must state age, and send twelve copies of their application and testimonials to the undersigned by 9 A.M. on Tuesday, 30th September, 1930.

By Order.

FRANK G. HAZELL, General Supt. and Secretary.

13th Sept., 1930.

County Borough of Wigan.

EDUCATION COMMITTEE.

APPOINTMENT OF ASSISTANT SCHOOL MEDICAL OFFICER.

Applications are invited from fully-qualified Women Medical Practitioners for the post of whole-time Assistant School Medical Officer at a salary of £500 per annum, advancing by £25 to £700 in accordance with the scale jointly approved by the B.M.A. and A.E.C.

Applicants must have been qualified three years and must have had experience in making prescriptions of glasses for errors of refraction. Preference will be given to those possessing a Diploma in Public Health.

The appointment will be subject to the provisions of the Local Government and Other Officers' Superannuation Act, 1922.

A list of duties may be obtained (on receipt of a stamped, addressed envelope) from the undersigned, to whom applications together with copies of three recent testimonials, must be sent by not later than Wednesday, September 24th.

L. R. MISSEN, Director of Education.

Education Offices, Town Hall, Wigan.

City of Manchester Education
COMMITTEE.

ASSISTANT SCHOOL MEDICAL OFFICER (MAN).

Applications are invited from fully qualified Medical Practitioners for the post of Assistant School Medical Officer.

Applicants must have been qualified three years and will be required to devote their whole time to the duties of the office. Preference will be given to those who have special experience in the prescription of spectacles.

The salary is £600 per annum, rising by yearly increments of £25 to a maximum of £750. There is also a yearly allowance of £10 for travelling expenses.

The person appointed will be required to contribute to the Superannuation Scheme of the Corporation.

Forms of application may be obtained from the undersigned and applications should be returned not later than Saturday, 27th September, 1930.

GEORGE GUEST, Acting Director of Education.

Education Offices, Deansgate, Manchester.

City of Birmingham.

SELLY OAK HOSPITAL.

CASUALTY OFFICER (MALE).

Applications are invited from fully qualified Medical Practitioners for the Whole-time appointment of Casualty Officer (Male) at the Selly Oak Hospital, Birmingham.

The present Hospital accommodation is 550 beds, divided into General Medical, General Surgical, Gynæcological, Obstetrical, and Children's Disease sections. There are completely equipped Pathological and Biochemical Laboratories and X Ray, Electrotherapeutic, Massage, Ultra-violet Ray, and Electrocardiographic Departments. Over 3000 operations are performed annually.

The appointment will be for a period of six months in the first instance, but may be extended at the end of that time for a further period of not exceeding six months.

The person appointed will be required to assist at operations, to administer anæsthetics, and to undertake casualty and such other duties as may be assigned to him by the Medical Superintendent.

The salary attached to the appointment is at the rate of £200 per annum, together with full residential emoluments (rations, apartments, laundry, and attendance). The Officer appointed will be required to account to the Council for all fees, allowances, and emoluments (other than the foregoing) received by him.

Further particulars of the appointment may be obtained from the Medical Superintendent, R. P. Stanley Kelman, Esq., M.B., F.R.C.S. (Eng. and Edin.), at the Selly Oak Hospital, to whom applications, stating age, experience, and qualifications, accompanied by copies of recent testimonials, should be forwarded not later than Wednesday, 24th September, 1930.

F. H. C. WILTSHIRE, Town Clerk.

The Council House, Birmingham, August, 1930.

Bristol General Hospital.

Notice is hereby given that a meeting of the Election Committee will be held at the Hospital at 1 o'clock P.M. on Wednesday, October 8th, 1930, for the purpose of electing an HONORARY DENTAL SURGEON. Applications, together with proof of qualification, to be forwarded to the undersigned on or before Monday, September 29th, 1930.

N.B.—An Honorary Assistant Dental Surgeon is a candidate for the appointment.

By order of the Committee,
September 10th, 1930. THOMAS W. GREGG, Secretary.

Southampton Children's Hospital and
DISPENSARY FOR WOMEN. (45 Beds.)

The Board of Management invite applications for the post of RESIDENT MEDICAL OFFICER (Lady). Appointment for six months. To commence duties on October 1st. Salary at the rate of £100 per annum, with board, residence, and laundry. Applications, stating age, and accompanied by copies of testimonials, to be sent to the undersigned, from whom further particulars may be obtained.

ELLA K. MATTHEWS, Secretary.

The King Edward VII. Welsh
NATIONAL MEMORIAL ASSOCIATION.

Applications are invited from duly registered Medical Practitioners for the post of ASSISTANT RESIDENT MEDICAL OFFICER at the GLAN ELY TUBERCULOSIS HOSPITAL, Fairwater, near Cardiff. Salary £250 per annum, plus maintenance; the appointment being limited to a period of twelve months.

Applications, stating age, qualifications and experience, together with copies of three recent testimonials, should reach the undersigned by September 24th, 1930.

D. A. POWELL, Principal Medical Officer.
Memorial Offices, Westgate-street, Cardiff.

Bury Infirmary, Lancashire.
(A General Hospital of 170 Beds.)

Applications are invited for the post of THIRD HOUSE SURGEON, who must have both Medical and Surgical qualifications, and have had some experience in the administration of Anæsthetics. The appointment is for six months, at a salary at the rate of £150 per annum, with board, residence, and laundry.

Applications, stating age, qualifications, and nationality, with copies of three recent testimonials, to be sent to the undersigned not later than the 24th September, endorsed "Third House Surgeon."

ALEX. W. MAITLAND, Honorary Secretary.

Northampton General Hospital.
(230 Beds.)

There will be vacancies on October 1st next for Two ASSISTANT HOUSE SURGEONS. British nationality. Salary £150 per annum, with board, residence, and laundry.

The successful candidates will be appointed for a period of six months, and will be eligible for re-election for a further period.

Candidates must be duly qualified and registered.

Applications, stating age, sex, qualifications, &c., with copies of testimonials, to reach the undersigned not later than first post on the 24th September, 1930.

15th September, 1930. H. ST. JOHN WOOD,
Secretary Superintendent.

National Radium Centre for
MANCHESTER.

The Committee wish to appoint a RADIUM REGISTRAR (Male) in connection with the above Centre. The appointment will be non-resident, and a minimum salary of £350 per annum will be given. Possibly the duties will be combined with others at the Manchester and District Radium Institute, and in that case the salary might be considerably augmented for a suitable applicant.

Applications should reach the Hon. Secretary, National Radium Centre for Manchester, The Radium Institute, Nelson-street, Manchester, not later than September 30th, 1930.

Gloucester County and City Mental
HOSPITALS.

JUNIOR ASSISTANT MEDICAL OFFICER (Male, single) wanted. Salary £350 per annum, with four annual increments of £25; such increases are conditioned by the obtaining of a Degree or Diploma in Psychological Medicine and will not be retrospective. Three months' study leave (D.P.M.) may be granted during the second year.

The appointment is subject to the provisions of the Asylums Officers' Superannuation Act, 1909, and for this purpose the emoluments, consisting of board, washing, and apartments, are valued at £104 per annum.

Applications, stating age and qualifications, together with copies of three recent testimonials, to reach the Medical Superintendent, County Mental Hospital, Gloucester.

Taunton and Somerset Hospital
(104 Beds), Taunton.

SENIOR HOUSE SURGEON required. Applicants must have held a Hospital Resident appointment for at least six months.

Salary at the rate of £150, with board, residence, and laundry. Three residents altogether.

Applications, with testimonials, to F. J. J. STACEY, Secretary.

Ancoats Hospital Convalescent Home,
Great Warford, Alderley Edge.

Applications are invited for the post of HONORARY VISITING PHYSICIAN to the above. Honorarium £50 per annum. Applications, stating age, qualifications, &c., to be in by 1st October next, accompanied by not more than three recent testimonials, and to be forwarded to the undersigned, from whom all particulars can be obtained.

By Order of the Board.
HERBERT J. DAFFORNE, General Superintendent and Secretary.

Northern Infirmary, Inverness.

Wanted immediately, THIRD RESIDENT MEDICAL OFFICER, fully qualified, registered, male, unmarried. Appointment will be for six months. Salary at the rate of £100 per annum, with board, residence, and laundry. Applications, stating age, medical school, qualifications, and experience, with copies of recent testimonials, to be sent to Mr. ROBT. GILBERT, Hon. Secretary, Inverness.

Walsall General Hospital.

The Committee invite applications from men for the post of HOUSE SURGEON. Salary £150 per annum.

Candidates, who must be registered under the Medical Acts, must produce three recent testimonials.

The appointment will be for six months.

The Hospital contains 100 beds, and is equipped in all Special Departments.

Applications, stating age, qualifications, and nationality, must be received by the undersigned immediately.

WALTER FRANCOMBE, Secretary.

NEW ZEALAND.

Christchurch Hospital Board.

The Board invites applications for a MEDICAL REGISTRAR. Salary £500 per annum, with board and lodgings. Applications should be forwarded to the Secretary, Hospital Board, Christchurch, New Zealand.

Shanghai Municipal Council.

PUBLIC HEALTH DEPARTMENT.

SECOND ASSISTANT COMMISSIONER OF PUBLIC HEALTH (HOSPITALS).

A Second Assistant Commissioner of Public Health (Hospitals) is required in the Public Health Department of the Shanghai Municipal Council.

Candidates, preferably unmarried, should not be more than thirty years of age, and must hold qualifications in Medicine and Surgery of University standard; a D.P.H., though not essential, is desirable. Candidates must have held Resident Hospital appointments, medical and surgical and practical experience of Isolation Hospital, V.D. and T.B. services is desirable.

Salary Tls. 650 per mensem, or Tls. 700 per mensem if holding a D.P.H., during three years' agreement.

The agreement is renewable, in the event of satisfactory services, at a triennial increase of Tls. 100 per mensem up to Tls. 1,000 or Tls. 1,050 per mensem if holding a D.P.H.

A tael at the present rate of exchange equals about 1s. 7d. Exchange is, however, subject to fluctuation.

A temporary bonus of Tls. 75 per mensem is issued at the present time to compensate for the increased cost of living and under certain limitations a guarantee of one-third of pay and bonus will be paid at the equivalent of 2s. 6d. to the Tael to offset the adverse fluctuations in the rate of exchange.

The Assistant Commissioner of Public Health (Hospitals), provided he holds the D.P.H., is eligible for the higher appointments of Deputy Commissioner of Public Health and Commissioner of Public Health, the present maximum pay for which is Tls. 1,350 and Tls. 2000 per mensem respectively.

First-class passage is given with half-pay during voyage.

Eight months' leave is given on full pay, with first-class passage, after every period of five years' service in Shanghai.

Free medical attendance is provided, and there is participation in the benefits of a Superannuation Fund.

Particulars of the appointment, and full details as to the benefits enjoyed by Municipal employees under their terms of service, may be obtained from the Council's agents.

Applications, in candidates' own handwriting, with full information as to their qualifications, experience, &c., accompanied by at least three recent testimonials, and endorsed "Second Assistant Commissioner (Hospitals)" on the cover, should be forwarded to Messrs. JOHN POOK & Co., Agents for the Municipal Council of Shanghai, 68, Fenchurch-street, London, E.C.3.

September, 1930.

Inverness District Mental Hospital.—JUNIOR ASSISTANT MEDICAL OFFICER wanted. Experience of Mental Hospital work not essential, but post-graduate medical or surgical experience a recommendation. Salary £350 per annum, with apartments, board, laundry, and attendance. Apply, with references, to Medical Superintendent.

Wanted.—Part-time Woman Assistant for Surgery Practice in poor district. Central London. Experienced private and panel practice, with dispensing. Write, stating free times and experience.—Address No. 940, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

Wanted, fully qualified Ophthalmic SURGEON for service in the Tropics. Agreement for three years. Salary £1000, £1100, £1200. Renewable thereafter by arrangement. Free furnished quarters and first-class passage provided. Provident fund. Candidates must be unmarried and under thirty-five years of age. Ladies not eligible.—Apply, with copies of testimonials (not returnable), to No. 932, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

MEDICAL JOURNALISM.

Applications invited from well-qualified Medical Men (age preferably under thirty-five) for whole-time post as SUB-EDITOR of Medical Journal, on probation. Commencing salary £750.—Full particulars of professional and literary qualifications, age, education, and knowledge of languages to be addressed, No. 935, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

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(WILLIAM H. GRANT).

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Telegrams: "REASIDE, TUBERCLE, WESTRAND, LONDON."

Young refined Science Student, first- class experience West-end dispensary, offers services to Medical Practitioner as DISPENSER and GENERAL ASSISTANT. Three years' science Manchester University. Requires easier hours for study. Drive any car. Interview.—L.B.S., 119, Esmond-road, Bedford Park, W.4.

Lady seeks post as Housekeeper- SECRETARY, or SECRETARY in Sanatorium. Cooking, needlework, light housework, shorthand-typing and account-keeping.—Address, No. 936, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

Lady Secretary desires post with Doctor, St. John's Wood district or near. Nineteen years' experience.—Apply, G.P.Y., 70, Ashworth-mansions, W.9.

London Medical Man recommends Young Lady. Good appearance (doctor's daughter), as Secretary-Assistant-Receptionist-Chauffeuse, to a Doctor or Dentist in London.—Address No. 939, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

Secretary seeks position. Hospital nursing experience, and as secretary to Practitioner. Thoroughly capable and efficient.—Miss E. M. ECCLESTONE. 53, Gloucester-terrace, W.2.

Wanted, Practice or Partnership by M.B., Ch.B. (Glasgow), Scot. Age thirty-four. Seven years' general practice. Energetic, excellent testimonials, capital available. House with garden preferably to rent.—Address, No. 937, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

Midland Town.—Old-established PRACTICE. Receipts £900 p.a., including panel 600. Good house, long lease. Rent £70. Long introduction if desired. Premium 2 years' purchase, payable £800 down. First year's income, £900, guaranteed.—Apply, Peacock & Hadley, Ltd., 19, Craven-street, Strand, W.C. 2.

To Purchasers.—Do not Buy without expert assistance. With fifty years' experience, Mr. PERCIVAL TURNER can advise in all cases. Terms free on application to 4, Adam-street, Strand, W.C.2. Telephone: Temple Bar 9011. Telegrams: "Epsomian, London."

Wanted.—Partnership in Practice with good opening for keen surgeon. Advertiser has been holding Resident Surgical appointment for three years. Midlands preferred.—Address No. 938, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

London, S.W. (near Kennington).— Well-established PRACTICE. Receipts £630 p.a., including panel 400. Nice house available. Premium £900.—Apply, Peacock & Hadley, Ltd., 19, Craven-street, Strand, W.C.2.

For Disposal.—A good Practice is not always to be had directly, but Mr. PERCIVAL TURNER can generally offer applicants something suitable. Nearly all the best practices are sold by him without being advertised.—Full information free on application to 4, Adam-street, W.C.2.

Opening—Growing village, 15 miles out, nearest Doctor 3½ miles. Surgery, garage, rooms and attendance. Trained Lady nurse's house.—Enquiries, Mr. ROUND, 515, Lordship-lane, London, S.E.22.

London, S.E. (15 mins. Elephant & Castle).—Very old-established cash and panel PRACTICE. Receipts £2600 p.a., including panel 4700. Good house, low rental. Premium £5000, cash if possible.—Apply, Peacock & Hadley, Ltd., 19, Craven-street, Strand, W.C. 2.

Suitable for Medical Man.—Salubrious part of Hastings. Detached RESIDENCE, three rec., five bed., &c. Garage, garden. £1750.—F. TANTON, F.A.I., St. Leonards.

Just the House for a Doctor. No resident doctor in neighbourhood. Near Sidmouth. Main road. Detached. Parquet flooring; (hall, one room), 3 rec., 4 bed (3 h. & c. water). Bathroom, Electricity, Garage (rooms over). Tennis court, two other lawns. Freehold £1700. —"Woodlands," Newton Poppleford, South Devon. No agents

EXECUTORS' SALE.

Palmer's Green.—Eminently suitable for Doctor. Prominent main road double-fronted house with side entrance. Three fine reception, six bedrooms, billiard, and bathroom, usual domestic offices. Large garden. Price £2400, or offer.—Apply, KING & CO., The Broadway, N. 21.

North Wales Coast, Abergele, Private semi-detached, freehold. Three entertaining, five bed and boxrooms, H. and C. water, good kitchen, &c. Small garden back and front, room for good garage. Splendid position for Doctor's house.—Mrs. WILLIAMS, "Gorphwysfa," Stanley Park Avenue, Rhyl.

10 MILES OF CHARING CROSS.

Doctor's House. Excellent Main Road Corner. Delightful house containing eight Bed and Dressing Rooms. Two Bathrooms. Three Reception Rooms (one fitted as Surgery). Modern Domestic Offices. Electric light. Perfect repair. Good Garden with Garage. Excellent opportunity for a Medical gentleman. Price £3500. Freehold. Substantial mortgage could be arranged.—Full details of Messrs. SPENCER & KENT, Surveyors, Beckenham Junction Station.

Consulting Rooms to Let, Harley- street and district, whole or part time. Lists sent on application.—Elgood & Co., 10, Henrietta-street, Cavendish-square, W.1. Tel.: Langham 2601.

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